

HP Professional

THE MAGAZINE FOR HEWLETT-PACKARD ENTERPRISE COMPUTING ▲ VOL. 7 NO. 7

JULY 1993

OPEN COMPUTING

**UNIX VENDORS
UNITE UNDER
COSE FLAG**

STANDARD EXCUSES

**Do What You
Can With What
You've Got**

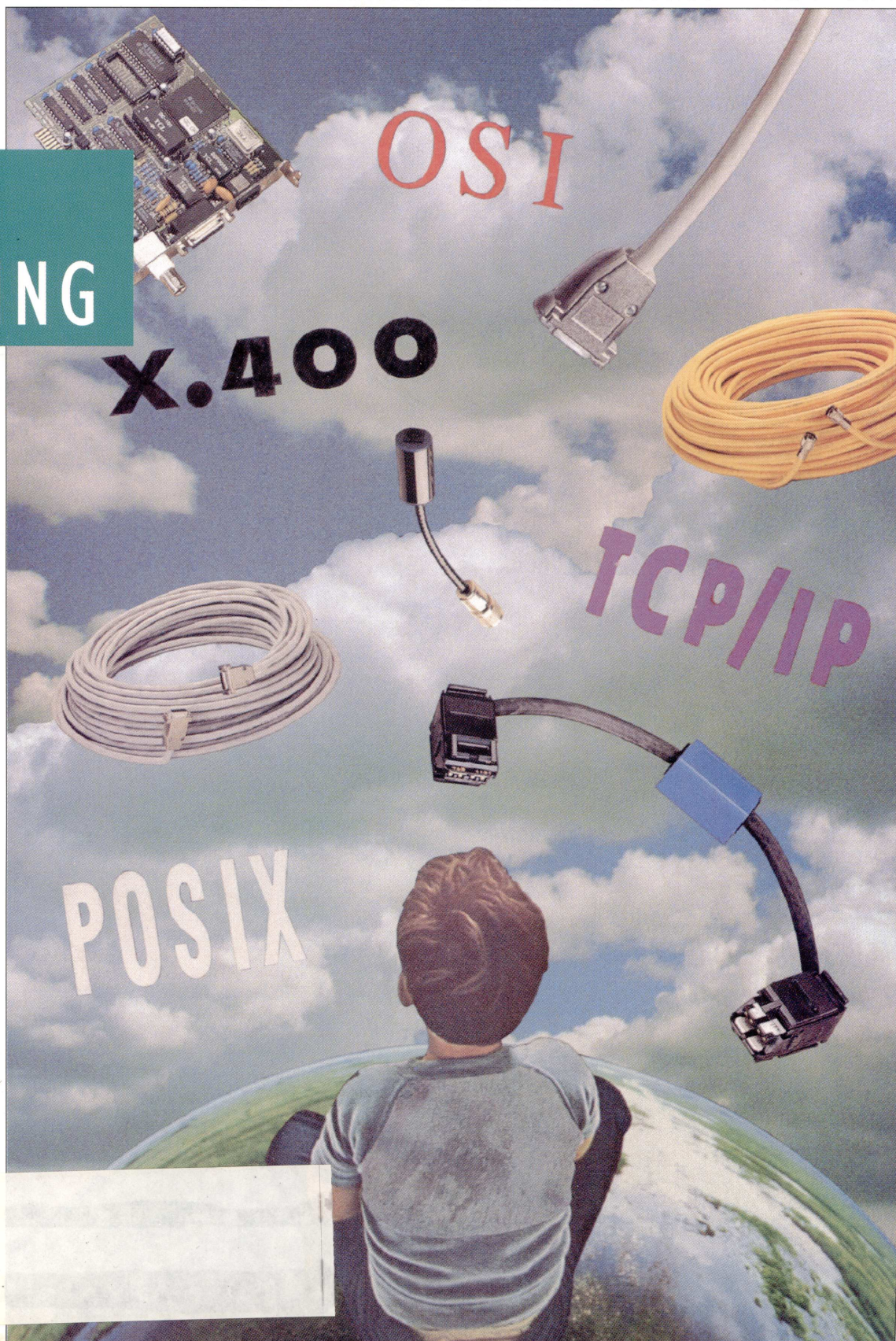
THE ACCESS ROUTE

**SQL Access Group
Paves The Road
To Heterogeneous
Databases**

DP LABS:

**Raxco's Security
Toolkit/UNIX**

**Kelly Computer's
Memory Boards**



Just what the doctor ordered!

and the government...and the universities...and the telecommunications companies ...and the aerospace industry ...and the banks...and ...



From Artecon

That's right. We've brought our considerable expertise, quality, and reliability in building and integrating value added enhancements into the HP, IBM, and SGI market places.

This is complemented by the reputation we have earned over the last nine years as being the best in the business in the Sun Workstation world.

From high end, high availability removable subsystems to disc, tape, and memory – we have it all!

Artecon uses quality Seagate 525MB-2.9GB hard disc drives, in an impressive variety of value added products. Seagate is one of the leading manufacturers of hard disc drives in the world.

All of our products come with all of our unique value adds. Like a one year onsite warranty – free of charge. Plus our GUI software products, DiskTool and DumpTool bundled with every subsystem we ship.

And of course, the quality and reliability that we are known for. At competitive prices, as always.

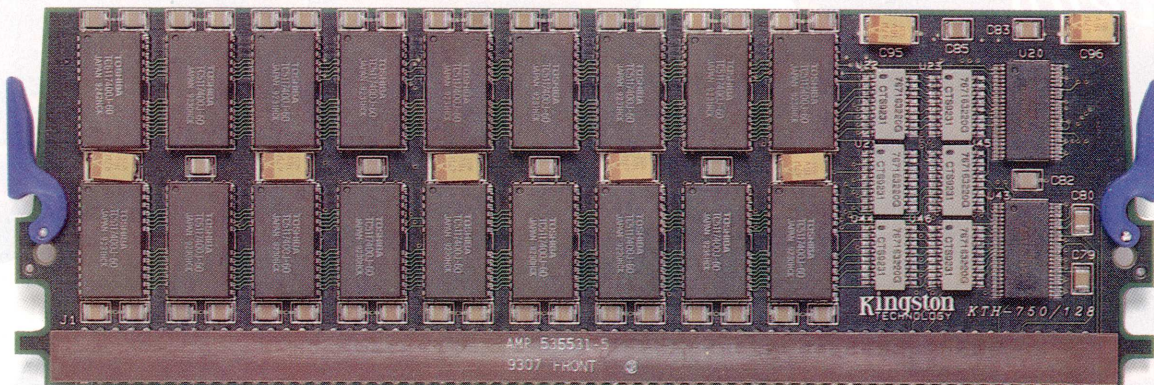
So if you are expanding your HP, IBM or SGI workstation and you want the comfort of working with the best, call Artecon. We've got the right prescription for you.

Call 1-800-USA-ARTE
(1-800-872-2783)

Artecon

2460 IMPALA DRIVE, CARLSBAD, CA 92008-7236
(619)931-5500 FAX(619)931-5527
email: sales@artecon.seagate.com
A Member of the Nordic Group of Companies

Artecon and the Artecon logo are registered trademarks of Artecon, Inc. Seagate and the Seagate logo are registered trademarks of Seagate Technology. All other trademarks and registered trademarks are proprietary to their respective manufacturers. Artecon, Inc. operates under a policy of Equal Employment Opportunity and is in compliance with Executive Order #11246 as amended.



Now Shipping!

HP/Apollo Series 9000 Model 750, 755 Memory

KTH 750/128

32, 64, 128MB

The HP Memory To Remember



Hewlett-Packard

Memory Enhancements

Kingston's HP and HP/Apollo memory enhancements lead the industry in competitive pricing, reliability, compatibility, selection and availability. Our workstation memory is backed by a lifetime warranty and free, comprehensive technical support. With Kingston HP and HP/Apollo compatible memory upgrades, you may spend less, but you truly get more.

Guaranteed Compatibility

As a Hewlett-Packard Channel Partner, we guarantee absolute compatibility of our memory upgrades with HP and HP/Apollo systems. We test every memory upgrade with HP's own system diagnostics and



operating system. Our memory upgrades are so compatible that Hewlett-Packard itself is a regular customer!

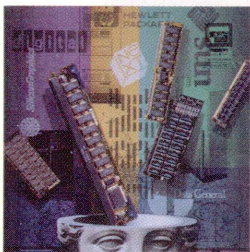
HP/Apollo Memory	
HP 3000 Business Systems 900 Series	16MB, 32MB and 64MB kits
HP/Apollo 9000 400 Series	4MB, 8MB, 16MB and 32MB kits
HP/Apollo 9000 700/RXstations	1MB, 2MB, 4MB and 8MB modules
HP/Apollo 9000 700 Series	8MB, 16MB, 32MB, 64MB and 128MB kits
HP 9000 Business Servers 800 Series	16MB, 32MB, 64MB and 128MB kits

Kingston has a full line of memory and storage upgrades for most popular HP and HP/Apollo workstations. With new products being announced every week at Kingston, give us a call for our latest offerings.

100% Testing, 100% Reliability

We've built our business around one concept—reliability.

Our technicians test each and every product before it's shipped. We back them with a lifetime warranty and free, comprehensive technical support. It's reliability that makes Kingston the inside name in upgrades.



For More Information

Call our workstation memory experts at



(800) 835-2545 or
(516) 673-6300 (East coast office). We'll be happy to answer any questions you have

about our memory upgrades for Hewlett-Packard, Data General, Digital Equipment, IBM, NeXT, Silicon Graphics, Solbourne, Sun and other popular workstation manufacturers.

Kingston Makes Memory For Workstations From These Manufacturers:

- HP
- Data General
- Digital Equipment
- Sun
- IBM
- NeXT
- Silicon Graphics
- Solbourne



THE INSIDE NAME IN UPGRADES

17600 Newhope Street, Fountain Valley, California 92708 (800) 835-2545 (714) 435-2667 Fax (714) 435-2618

CIRCLE 281 ON READER CARD

Attended Backup:

As much as you'd like to, you can't leave your car while traffic is backed up.

But you can leave the office while your system is backing up—

with reliable, affordable solutions from IEM.

Unattended Backup:



- 4mm, 8mm, QIC
- SCSI & HP-IB
- Standalone drives, autofeeders, and network backup software



IEM manufactures the broadest range of solutions for your backup and data transfer needs.



One Source, Many Solutions

IEM is the manufacturer of the largest line of HP third-party peripherals.

In the U.S. and Canada:

IEM, Inc., P.O. Box 1889
Fort Collins, CO 80522 USA
Phone: (1) 303-221-3005
(1) 800-321-4671
Fax: (1) 303-221-1909

In the United Kingdom:

IEM Europe, Colorado House,
Cromwell Park, Banbury Road,
Chipping Norton, Oxfordshire. OX7 5SR.
Phone: +[44] 0608 645000
Fax: +[44] 0608 645155

All others:

IEM International Sales
1629 Blue Spruce Drive
Fort Collins, CO 80524
Phone: (1) 303-221-3005
Fax: (1) 303-221-1909

CIRCLE 122 ON READER CARD

22 THE PEACEMAKER*By Bill Sharp*

The introduction of Windows NT forces major UNIX vendors to ally themselves in a COSE relationship. With a vow to work out inconsistencies in system management across UNIX versions, the Common Operating System Environment attempts to halt the advancing NT threat.

28 THE STANDARD EXCUSES*By Gordon McLachlan*

As industry standards and the bodies that create them proliferate, open systems has become a bureaucratic maze of acronyms and stop-gap solutions — the trick is doing what you can with what you've got.

34 THE ENTERPRISE ACCESS ROUTE*By David Himes*

The road to seamless data access across heterogeneous databases has been a bumpy one — but the SQL Access Group is attempting to smooth the way to ensure that the open system dream of enterprise data access becomes a reality.

40 THE SEVEN CHAKRAS OF OBJECT-ORIENTED PROGRAMMING*By Gordon McLachlan*

Let Bhagwan Bob enlighten you with insights into inheritance, polymorphism and other mysteries of object consciousness. Discover the three noble truths of object orientation.

C O L U M N S / D E P A R T M E N T S**Objectively Speaking: Use It Or Lose It***By Richard Riehle*

Without New Methodologies Where Does Application Development Go? **52**

PC TIPS: On The Other Hand*By Miles B. Kehoe*

Don't Count Out MS-DOS V6.0 Just Yet! **54**

Networking: Environmental Awareness*By Tim Cahoon*

Save Network Addresses Through Conservation **56**

And Another Thing: Computers Gone South*By Gordon McLachlan*

If American Taco Production Isn't Safe From Downtime, What Is? **72**

Editorial **8**

Industry Watch **10**

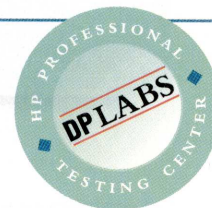
New Products **58**

Advertiser Information **65**

Product Showcase **68**

Career Opportunities **70**

Advertiser Index **71**

**R E V I E W S****HP 3000 Memory Enhancers***By John P. Burke*

Kelly Computer Bundles
Performance-Boosting
Resource Management
Software With Add-in
Memory Boards **44**

The UNIX Networkshop*By Michele Petrovsky*

Raxco's Security Toolkit/
UNIX V2.1 Tightens
Network Integrity Without
Nailing Down Your
System's Power **46**

The Terminal That Would Be King*By Tim Porreca*

Tektronix's XP12 X
Terminal Goes Above and
Beyond The Common
Terminal **50**

PRODUCT WATCH:**Across The Universe**

Visix Software's Galaxy . **14**

Class Act

Lotus Development
Corp's Multimedia
SmartHelp **16**

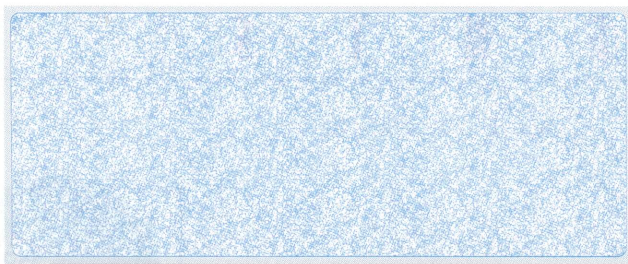
STRATEGIC DIRECTIONS:**Apollo Revival**

SAR Inc. **18**

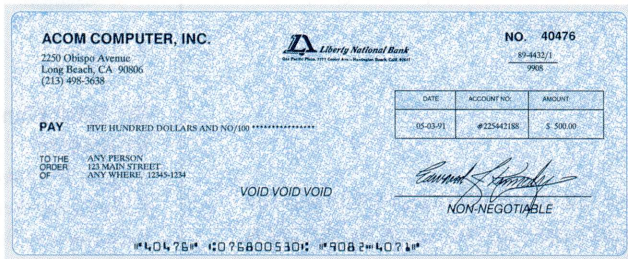
Open Upper Cut

Lawson Associates **20**

Cover Illustration
by Dennis Irwin



Before.



Seconds Later.

The best way to solve your check writing problems is to start with a blank sheet of paper.

Introducing ACOM's family of MICR laser check printers.



MC 4816
16 pages per minute
50,000/mo duty cycle

Starting with a blank sheet of safety paper, ACOM MICR printers turn out completed checks. In seconds, they print the MICR line, the name of the bank, your company's name and logo, your signature, and all variable information.

Simultaneously write checks from multiple accounts.

Because ACOM MICR printers use blank stock, you can write checks from multiple accounts at the same time. There's no need to

switch pre-printed stock every time you switch bank accounts.

Greater security.

All critical data, including the MICR font, signature and logo is contained in a security cartridge that you can store in a safe place when not in use. It sure beats the hassle of storing boxes of pre-printed checks.



MC 4808
8 pages per minute
5,000/mo duty cycle

Remote check processing.

You can take secure information from your host and download it to a remote site to produce completed checks. It's both convenient and secure.

Reduces costs.

ACOM MICR laser check printers eliminate the need to buy costly pre-printed checks, expensive bursters, refanners and signature stamps.

Data and word processing, too.

You can use your ACOM MICR printer for other applications besides check writing. These printers handle processing, bar codes and forms, too. Let ACOM solve your check writing problems. Call (800) 347-3638. In California, call (310) 424-7899.

ACOM

#1 in MICR system solutions.

CIRCLE 200 ON READER CARD

UNIX is a registered trademark of AT&T in the U.S.A. and in other countries.

MS-DOS is a trademark of Microsoft.

Macintosh is a trademark of Apple Computer Inc.

X Window System is a trademark of MIT.

Microsoft is a registered trademark of Microsoft Corp.

NewWave is a trademark of Hewlett-Packard Co.

HP Professional

EDITOR-IN-CHIEF Charlie Simpson
ASSOCIATE EDITOR Andrea J. Zavod
TECHNICAL EDITOR Bill Sharp
CONTRIBUTING EDITOR Gordon McLachlan
APOLLO EDITOR Fred Mallett
HP 3000 EDITOR John P. Burke
INTERNATIONAL EDITOR Marsha Johnston
NETWORKING EDITOR Tim Cahoon
PC/UNIX EDITOR Miles B. Kehoe
SOFTWARE ENGINEERING EDITOR Richard Riehle
EDITORIAL COORDINATOR Connie Gebbia
EDITORIAL ASSISTANT Stephen G. McDowell
CONTRIBUTORS Lynn Haber, David Himes, Lonni Wright
DP LABORATORY AND TESTING CENTER

MANAGER David B. Miller
ASSISTANT LAB MANAGER Anne Schrauger
REVIEW EDITORS John P. Burke, Tony Fiorito, Miles B. Kehoe, Michele Petrovsky, Barry Sobel

DESIGN & PRODUCTION

ART DIRECTOR Al Feuerstein
PRODUCTION MANAGER Jean Lait
DESIGN/PRODUCTION ASSISTANT Jack Rotoli
PRODUCTION COORDINATOR Teri Campbell

CIRCULATION

ASSISTANT CIRCULATION DIRECTOR Carrie Eisenhandler
DIRECTOR OF DATABASE SERVICES Marjorie Pitrone
DATABASE MANAGER Phyllis Chandler

MARKETING

PROMOTIONS DIRECTOR Timothy M. Kraft
PROMOTIONS WRITERS Craig T. Kelly, Ronald Sklar
SENIOR GRAPHIC DESIGNER Thomas Owen
GRAPHIC DESIGNER Mike Cousart

PUBLISHER Leslie Ringe

CARDINAL BUSINESS MEDIA, INC.

PRESIDENT AND CHIEF EXECUTIVE OFFICER: Robert N. Boucher
CHIEF FINANCIAL OFFICER Thomas C. Breslin
EXECUTIVE DESIGN DIRECTOR Leslie A. Canuso
CIRCULATION DIRECTOR Henry B. Lawrence
HUMAN RESOURCE MANAGER Mary Steigenwalt
CONTROLLER Andrew D. Landis
EXECUTIVE CONSULTANT Carl B. Marbach

For more information on how to contact your sales representative, see page 71. For subscription information and address changes, call (215) 957-4269. Editorial, advertising sales and executive offices at 101 Witmer Rd., Horsham, PA 19044 ■ (215) 957-1500 Corporate FAX (215) 957-1050. To reach staff listed on masthead via UUNET, send MAIL to: LAST NAME@CARDINAL.COM

HP PROFESSIONAL ISSN 0896-145X is published monthly by Cardinal Business Media Inc., 101 Witmer Rd., Horsham, PA 19044. Subscriptions are complimentary for qualified U.S. and Canadian sites. Single copy price, including postage \$4. One year subscription rate: \$30 U.S. and Canada; \$60 foreign. All orders must be prepaid. For reprints, contact Reprint Management Services, 505 E. Airport Rd., Lancaster, PA 17601; (717) 560-2001, Fax (717) 560-2023. Second Class postage paid at Horsham, PA 19044, and additional mailing offices. POSTMASTER: Send all correspondence and address changes to HP PROFESSIONAL, P.O. 616, 101 Witmer Rd., Horsham, PA 19044. COPYRIGHT © 1993 by Cardinal Business Media Inc. All rights reserved. No part of this publication may be reproduced in any form without written permission from the publisher. All submitted manuscripts, photographs and/or artwork are sent to Cardinal Business Media, Inc. at the sole risk of the sender. Neither Cardinal Business Media, Inc. nor HP PROFESSIONAL magazine is responsible for any loss or damage. HP PROFESSIONAL is an independent journal not affiliated with Hewlett-Packard Company. HP and Hewlett-Packard are registered trademarks and HP PROFESSIONAL is a trademark of Hewlett-Packard Company.

Printed in U.S.A.

VBPA ABP

THE FASTEST WAY TO PUT 25 GB ON A SINGLE TAPE.



The CY-8500 can store up to 25 GB on a single tape, at speeds of up to 90 MB per minute, completely unattended.

How? With hardware data compression that can boost capacity by up to five times.

No other 8mm tape drive can match the capacity, speed, and price-performance of this best-selling drive.

ADVANCED. You'll never be left in the dark. A bright, backlit status display gives you the command under execution, transfer rate, compression ratio, amount of tape remaining and more.

Our *data compression* option is the fastest available. And it's switch selectable, so you can still read and write standard tapes. Locate and restore files quickly and easily with our *accelerated file access* option. Add *data encryption* to control backup and restore operations through the use of encoded card keys.

FLEXIBLE. The CY-8500 is plug compatible with virtually every computer system. Rack mounting options, dual drive configurations and a variety of cable lengths ensure a seamless fit into your computing environment. And as storage needs grow, you can upgrade to our ten tape library, capable of managing between 25 GB and 250 GB—all without manual intervention.

RELIABLE. A sophisticated Error Correction Code yields a bit error rate of less than one in 10^{17} —the best in the industry. A MTBF rate of 60,000 hours ensures reliability.

Each turnkey subsystem features a 12-month warranty that includes technical support from our experienced in-house engineering group.

Everything you want in a backup subsystem is available right now.

Call today for information at
(804) 873-9000

CIRCLE 112 ON READER CARD

TRUE PLUG COMPATIBILITY

Alliant	Motorola
Alpha Micro	NCR
Altos	NeXT
Apollo	Novell
Arix	OS/2
AT&T	PS/2
Basic-4	Parallel
Concurrent	Port
Convergent	PC 386/ix
DataGeneral	PC MS-DOS
DEC SCSI	PC Xenix/
DEC BI-Bus	Unix
DEC DSSI	Pertec
DEC HSC	PICK
DEC Q-Bus	Plexus
DEC TU/TA81	Prime
DEC Unibus	Pyramid
Gould/Encore	Sequent
HP	Silicon
IBM AS/400	Graphics
IBM Mainframe	STC
IBM RISC/6000	Stratus
IBM RT	Sun
IBM S/38	Texas
ICL	Instruments
Intergraph	Unisys
Macintosh	Ultimate
McDonnell	Wang
Douglas	and more

CONTEMPORARY
CYBERNETICS

Rock Landing Corporate Center • 11846 Rock Landing
Newport News, Virginia 23606 • Fax (804) 873-8836

SPECint92

110

95

80

65

50

35

20

0

Sun
Classic

HP
715/33

IBM 6000-
M20

Sun LX

HP 715/50

Sun
10/30
LC

IBM
6000-
355

HP 725/50

Sun
10/40

IBM 6000-
375

Sun
10/51

IBM 6000-
365

DEC 3000-
500

HP 735

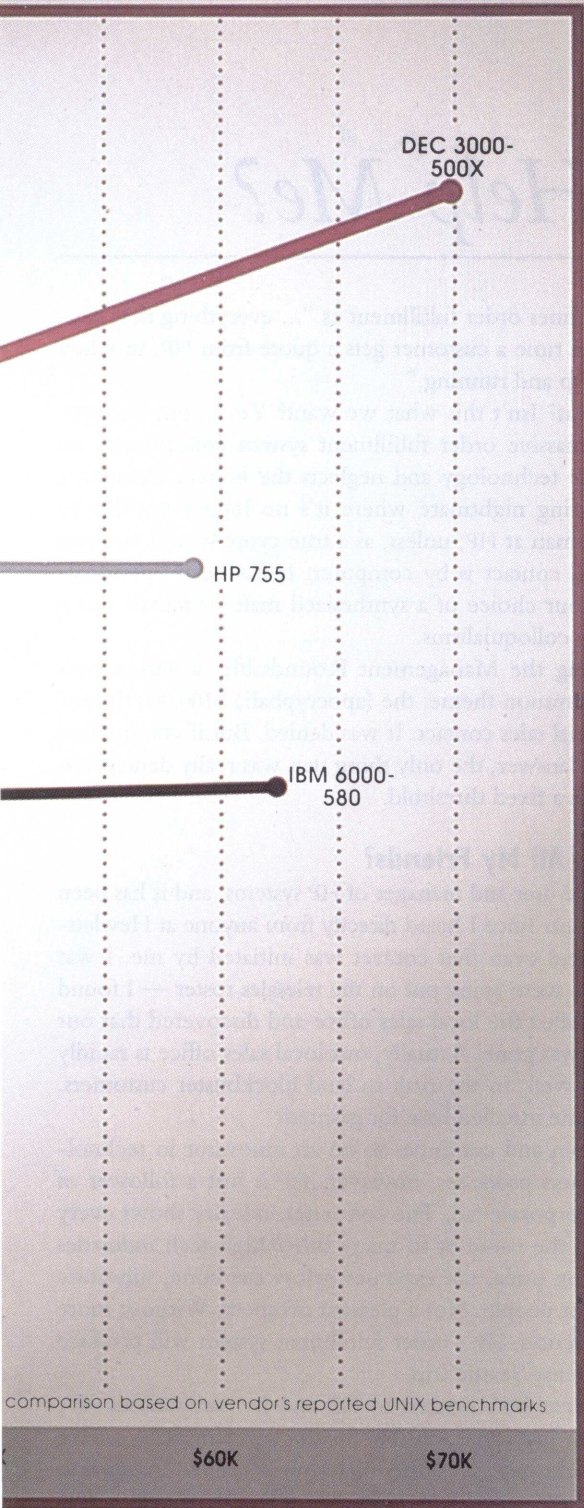
DEC 3000-
400

DEC 3000-
300

DEC
3000-300L

i

magine working faster than you ever



DIGITAL ANNOUNCES THREE NEW WORKSTATIONS THAT PUT IBM™, HP™ AND SUN™ IN THEIR PLACE.

Digital introduces three new members of its Alpha AXP™ workstation family—the world's fastest family of workstations. The DEC™ 3000 Model 300L AXP workstation, the world's fastest for under \$5,000. The Model 300, the world's fastest for under \$10,000. And the Model 500X—the world's fastest, period. Alpha AXP workstations. Their breakthrough technology is so powerful they can truly increase your productivity and provide solutions you never before thought possible.

And all are available now. To find out more about Alpha AXP workstations, our comprehensive trade-in and migration programs, or pre-sales technical assistance, call 1-800-DIGITAL, press "2," and ask for extension 77M. Or, for immediate information via Digital's Alpha AXP Fast FAX, call 1-800-842-7027 in the U.S. and Canada. Or contact your local Digital Representative.

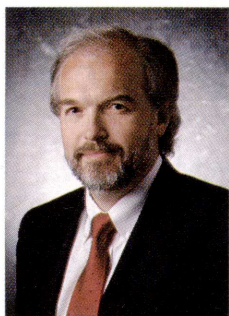


PUTTING IMAGINATION TO WORK

imagined.

digital™

Can Somebody Please Help Me?



By John P. Burke

• • •

In the rush to improve the short-term bottom line, companies cripple their sales, service and support infrastructure — believing technology can replace experienced people.

The ICMS turned out to be surprisingly well attended. HP's big announcement, at the decidedly HP 3000-oriented show, covered four new high-volume production printers. Not what I would call a show-stopper. The good stuff at the ICMS was "not for publication."

There was a variety of exhibitors, however in many cases, the booths were populated with second level personnel. And, there were some surprising absentees — like a certain major 4GL vendor and the major third-party relational DBMS vendor. With HP, the same story — second level people. No Lew Platt. No Wim Roelandts. No Glenn Osaka, either. Odd.

HP did "announce" a free, semiannual strategic video conference "designed to communicate ... current and future vision for the HP 3000." Puzzling is why HP held the first of these video conferences the day after the ICMS, a travel day for many of us. Olivier Helleboid, the extremely new CSY marketing manager for the HP 3000, who replaced Glenn Osaka, delivered the HP 3000 Product Line Strategy Update at the ICMS to people who paid dearly to be there. The A-team, Rich Sevcik and Glenn Osaka were scheduled for the freebie. At least the next video conference was rescheduled not to conflict with the September INTEREX.

At the Management Roundtable, Manuel Diaz, general manager CSO/Americas, delivered a short presentation on a subject near and dear to everyone's heart — the order fulfillment system.

HP is clearly focused on order fulfillment — at least the technology. Diaz speaks about it as if it were the "promised land." Lew Platt, in HP's 1992 annual report says, "Along with improving profitability, [order fulfillment is] our top priority for

1993." HP defines order fulfillment as "... everything that happens from the time a customer gets a quote from HP, to when a product is up and running."

Sound great? Isn't this what we want? Yes ... but unfortunately, this massive order fulfillment system concentrates on bleeding edge technology and neglects the human element. I have a recurring nightmare where it's no longer possible to speak to a human at HP; unless, as a true cynic would say, you pay extra. All contact is by computer. It has been "personalized" with your choice of a synthesized male or female voice that speaks in colloquialisms.

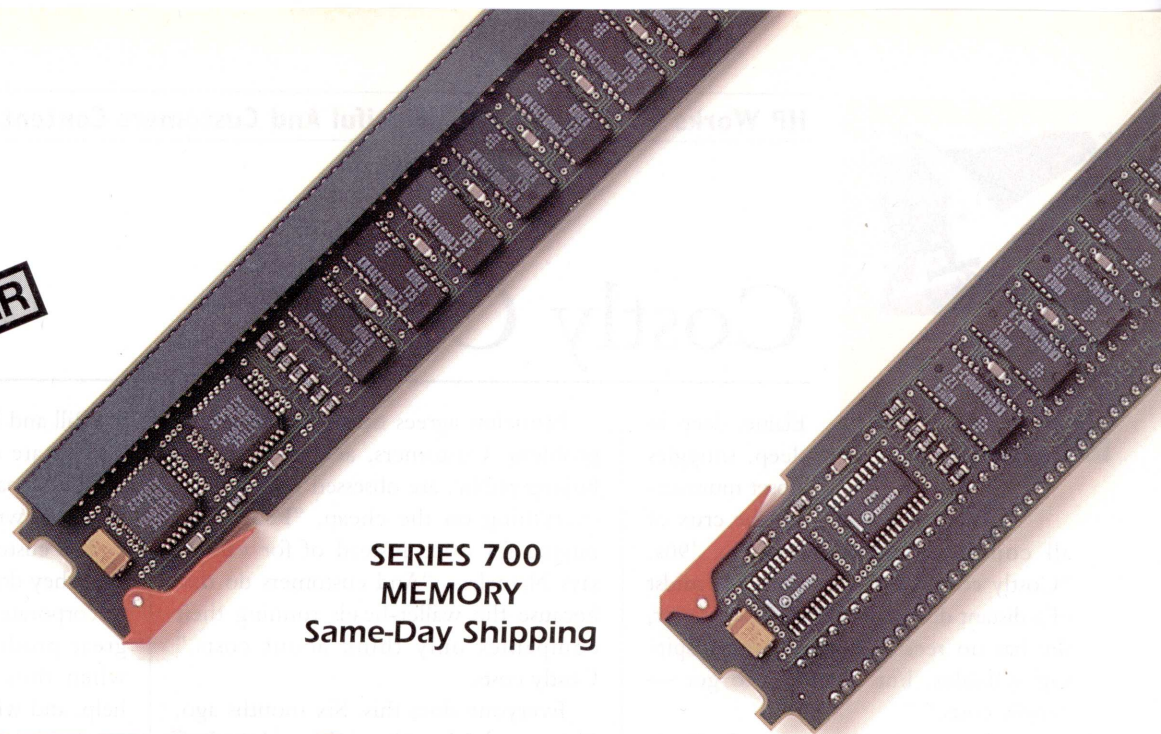
Also during the Management Roundtable, a variant was asked on a common theme: the (apocryphal?) \$100,000 threshold for personal sales contact. It was denied. But if you listened closely to the answer, the only thing that was really denied was that there was a fixed threshold.

Where Are All My Friends?

I'm an average user and manager of HP systems, and it has been more than a year since I heard directly from anyone at Hewlett-Packard — and even that contact was initiated by me. I was never told we were being put on the telesales roster — I found out when I called the local sales office and discovered that our sales contact was gone! Actually, our local sales office is rapidly vanishing, as well. In the rush to land blockbuster customers, is HP taking the installed base for granted?

HP has been and continues to be an innovator in technology. In business processes, however, HP is just a follower of the current corporate fad. The computer industry shows every sign of going the route of so many other high-tech industries — compete on price, cut expenses below the bone, substitute technology for people. Not a pleasant prospect. Without more human interaction, HP's order fulfillment system will produce situations like my Seattle trip.

The problem isn't limited to HP and its competitors. We consumers are just as responsible for this sorry mess. We have become price conscious to the exclusion of value. Discussions of open systems and standards always stress that they create competition that drives down prices — the siren song for the walletheads that control industry. Let's start looking at total value received, not just the sticker price; ultimately, we get what we pay for. — John P. Burke is HP Professional's HP 3000 editor.



**SERIES 700
MEMORY**
Same-Day Shipping

EXCEPTIONAL MEMORY

Available now from Newport Digital.

We deliver the quality and service you expect from the leader in HP workstation enhancements. Our complete line of TURBO cards and memory products is ready to ship from stock. Order today. Upgrade your system tomorrow!

Superior quality by design.

Every product we make is rigorously tested and guaranteed to meet or beat HP quality... and each is backed with our unconditional lifetime warranty.

Remarkable value guaranteed.

Evaluate any of our memory products in your workstation for 30 days. If you're not completely satisfied, return it without obligation.

CALL TODAY for complete information or to place an order for these and other innovative products from Newport Digital.



Comprehensive Selection

HP Series 9000	MB	1	2	4	8	12	16	32
HP-200/310/320		■	■	■	■			
HP-319				■	■			
HP-330/350/370				■		■		
HP-332				■				
HP-340				■				
HP-345/375/380				■	■		■	■
HP-360				■	■	■	■	
HP-362			■	■	■			
HP-382				■	■		■	
HP-400/425/433				■	■		■	■
HP-425E				■	■		■	
HP-700RX		■	■	■	■			
HP-720/730/750							■	■

NEWPORT DIGITAL
1-800-383-3642

14731 Franklin Avenue, Suite A
Tustin, California 92680
(714) 730-3644

CIRCLE 488 ON READER CARD



INDUSTRY WATCH

Bill Sharp

all computer problems of the '90s. "Costly costs," she coos from the midst of a distant dream, and drifts away. Later, she has no recollection of these inspiring syllables, but I cannot forget — "costly costs."

Costly costs cause calamities for Digital of Maynard, Mass. and for IBM in the Hudson Valley, and they just as surely cause pain in HP's Palo Alto.

Costly costs for some firms mean the price they pay for lagging behind in technology, or allowing manufacturing expenses to get too high, or for failing to innovate fast enough. There are firms in this business for whom costly costs mean loss of market share, layoffs, and even loss of their entire business.

Companies fond of remaining in business find themselves walking a tightrope — trying to maintain a balance between preserving profitability by holding down costs, and spending enough time and energy on customers and products to ensure business growth.

A certain long-time HP customer who shall remain Nameless is more than a bit disgusted with HP's sales force changes. In the old days, he recalls, HP sales folks visited small- to medium-sized customers, spent a considerable amount of time consulting them about their problems and helping to devise computing solutions to fit their needs. "Since the sales force reorganization, HP sales people have virtually disappeared," says Nameless. "I haven't heard from an HP salesperson in more than a year, and I get almost nothing in the way of sales literature. I get more literature from IBM and DEC than I do from HP!"

Elaine, deep in sleep, snuggles closer murmuring the crux of

Nameless agrees on the cause of the problem. Customers, and most of the buying public, are obsessed with buying everything on the cheap. "People are buying for price instead of for value," says Nameless. "And customers do that because the wallet-heads running their companies only think about costs." Costly costs.

Everyone does this. Six months ago, Elaine and I bought a cheap, knockoff PC to hold down our costs. Six days ago we finally talked the dealer into taking it back — it was junk. Instead, we bought the highest quality (not highest-priced) PC we could afford. Our second purchase was based on value, not price.

The computer marketplace is far more complex than our latest PC purchase. When HP sees its high-flying rivals nose-diving into the dirt, it responds with the best products it can, and holds its costs as low as possible in case times get tough

for Bill and Dave's company, too. Open systems are driving costs down, and the smart companies are matching their costs to that downward price movement.

But customers don't see cost control. And they don't even relate all that much to corporate nosedives — they just want great products and super service. So when they want friendly computing help, and what they get instead of a personal visit is what Nameless calls "the disembodied voice," customers get irritated.

They get irritated enough to complete questionnaires such as the one Interex sent out in January to 4,000 members, 23 percent of whom sent back their feelings in no uncertain terms. Jane Copeland, president of U.S. Holland House Inc., (Austin, TX) and head of the Interex advocacy group, says the feedback is close to what you might expect — customers give HP hardware overall a 99 percent approval rating.

Topic from Interex survey

Approval rating

Cost of hardware maintenance	68%
Ease of changing hardware support contracts	71%
Software SE support	78%
Cost of software	58%
Ease of changing software support contracts	70%
Salespeople knowledge of products	67%
Access to information on products	69%
Easy to understand price quotations	56%
Access to information needed to order	53%
Easy to order HP products	60%

Results from Interex's January 1993 questionnaire.

UP UNTIL NOW, MULTIMEDIA ON YOUR HP® WORKSTATION HAS BEEN HOCUS-POCUS

Finally, full multimedia on your HewlettPackard® Series 700 workstation is a reality.

It's brought to you by MediaMagic, a company that has worked hand-in-hand with HP for over 17 years. And it has all the necessary parts needed to plunge you into the world of multimedia.

VIDEO—AUDIO—COMPRESSION

Prepare to be dazzled by live 24-bit full-motion video accompanied by CD-quality audio. Adding sound and motion will transform the way you think about your workstation. It may even change the way you plan your next project.

However, the video and audio components really pay off when you add *JPEG*—a compression daughter card that allows you to store, edit and play back video and audio at 30 frames per second.

MAKE YOUR OWN MAGIC

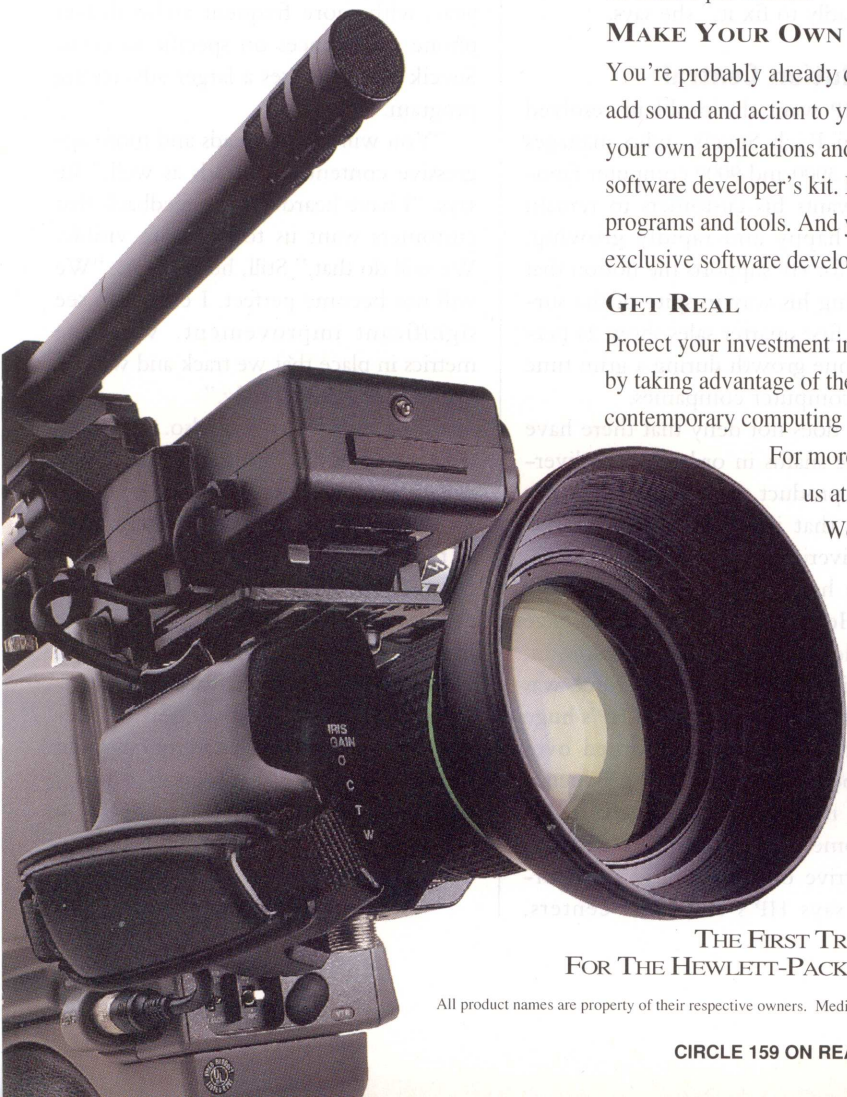
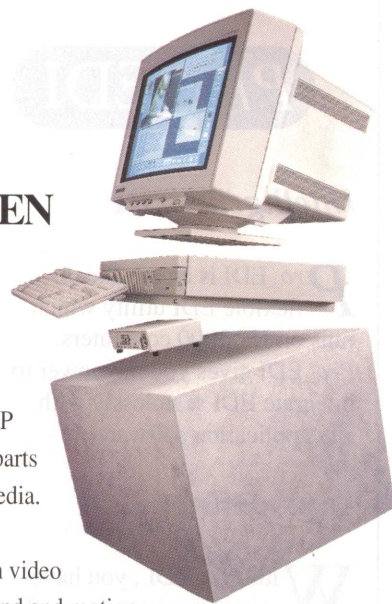
You're probably already dreaming of a few new ways to add sound and action to your next project. If you want to write your own applications and make them happen, get our software developer's kit. It's available along with sample programs and tools. And you'll get to take advantage of the exclusive software developer's hotline.

GET REAL

Protect your investment in your HP Series 700 workstations by taking advantage of the single fastest growing trend in contemporary computing - multimedia!

For more information please contact us at (214)669-3408.

We'll make a believer out of you.



THE FIRST TRUE MULTIMEDIA INTERFACE CARD
FOR THE HEWLETT-PACKARD® SERIES 700 WORKSTATIONS.

All product names are property of their respective owners. Media Magic, Inc. 222 Municipal Drive Richardson, TX 75080.

CIRCLE 159 ON READER CARD

Pro_EDI

Intelligent EDI

Pro_EDI is an advanced, flexible EDI utility which runs on HP 3000 computers. Pro_EDI gives you the power to integrate EDI seamlessly with any application software.

User-defined EDI

With Pro_EDI, you have complete control over the conversion of EDI data formats to the formats used by your own software. You can define transaction sets *exactly* as your trading partners do. You have total flexibility to define the files you use to interface with your applications. You can control, at the element/sub-element level, the conversion of data to and from the EDI formats and the application software formats.

Pro_EDI supports all ANSI X.12 standards and derivatives (such as TDCC, VICS, AIAG, etc.), and UN/EDIFACT.

Pro_EDI runs on all HP 3000 computers, both MPE/V and MPE/XL.

Usage-based pricing

Pro_EDI pricing is based on the number of document types you need, *not* on the type of CPU you have. You pay for what you use, not for the size of your machine.



Pro Software, Inc.
Suite 240
725 Barclay Circle
Rochester Hills, MI 48307

(313) 299-0020 (Voice)
(313) 853-2442 (FAX)

Pro_EDI and the Pro_EDI logo are trademarks of Pro Software, Inc.

The Next Generation of EDI

There were, however some approval rating surprises, including those listed in Table 1.

"HP has fundamentally changed the way [it is] operating [its] business in the last 18 months," says Copeland. "[The company] has completely reorganized the sales force, but it takes longer to change the support system than it does to change the people." She says HP sales territories are much larger than in the past and product turnover requires salespeople to assimilate up to 3,000 pages of documentation each month.

HP CEO Lew Platt notes in the 1992 annual report that order fulfillment is a key focus for the company this year. That may explain that, while customers for the most part take a "wait-and-see" attitude toward the problem, HP employees seem almost hyperactive over it.

Copeland finds HP's level of concern somewhat embarrassing. "Sometimes they want to try to fix the problem before they understand it, because they want so badly to fix it," she says.

HP's Solution Central

Few at HP want the problem resolved more than Rich Sevcik, who manages both HP's 3000 and 9000 computer families and wants his customers to remain blissfully happy and rapidly growing. Sales data for HP supports the notion that he is getting his way in spite of the survey. HP's first quarter sales show 24 percent revenue growth during a grim time for most computer companies.

Sevcik does not deny that there have been some snafus in orders and deliveries. "Our product success has been phenomenal, that is straining our system. Some deliveries have not been on time, and some have not been coordinated," he says. He admits some deliveries have taken as long as 10 weeks. In addition, the effectiveness of HP's sales force was hampered in December when HP's huge computer product rollout turned over some 80 percent of computer products.

In the near term, says Sevcik, HP is adding some people to ensure that deliveries arrive on time and in good order. He says HP's solutions centers,

which coordinate deliveries, also will be improved to help handle the increased volume.

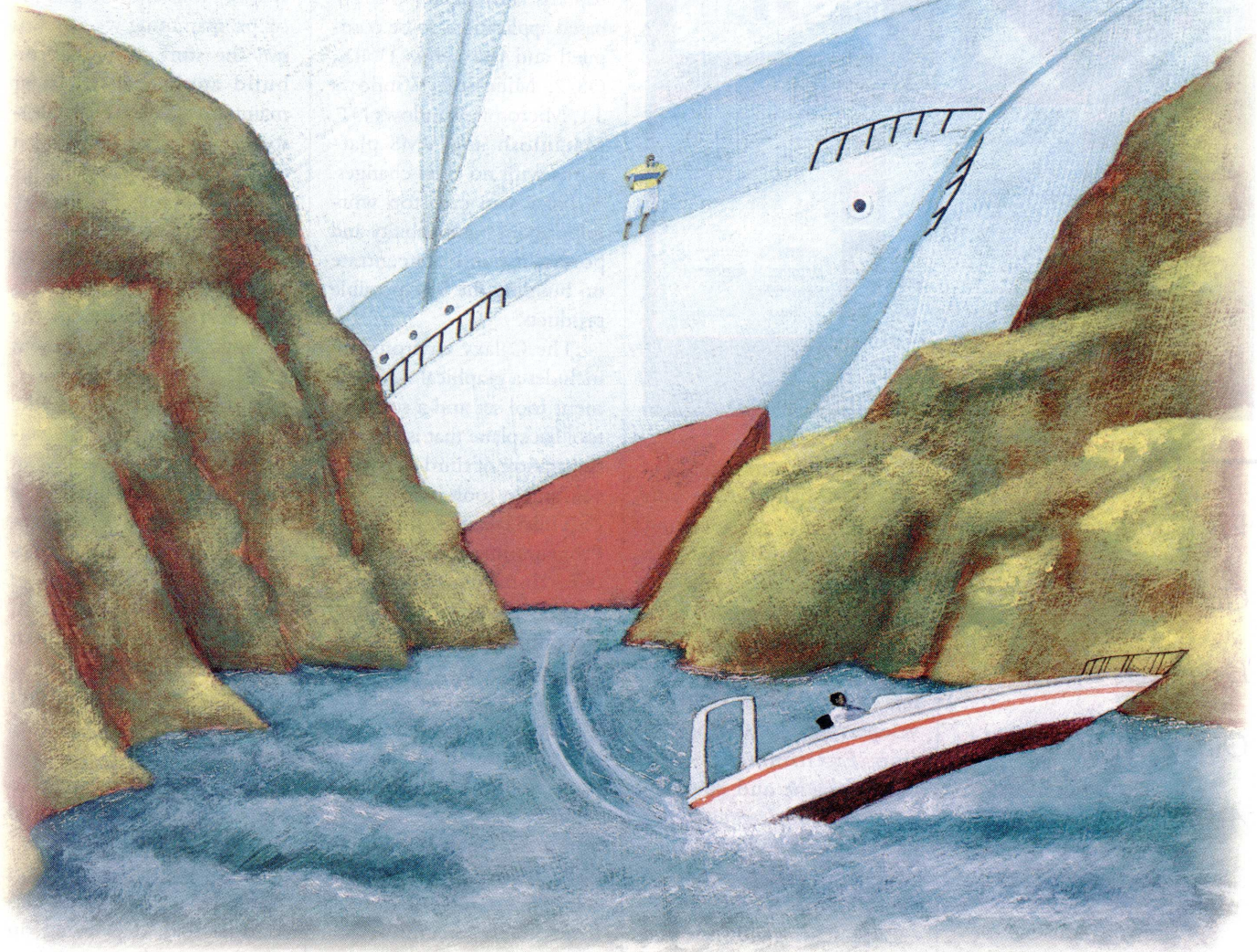
The new order processing system, however, will be HP's big shot at this problem. Sevcik notes that customers won't see the system itself, although they will experience improved service once it arrives. Instead of the current, aging batch-process system with cryptic interfacing, the new system will be based on on-line transaction processing. The processing provides a graphical user interface residing on PC or UNIX workstations that will graphically configure the proposed system, as well as confirm the order and configuration. Printouts of the order and configuration diagram with confirmed ship date will be relayed to customers either the same day or the next — but, this is at least a year away.

To improve communications with customers, Sevcik says each product line will produce video telecasts to provide product updates and a discussion twice a year, with more frequent audio dial-in phone conferences on specific subjects. Sevcik also promises a larger advertising program.

"You will see more ads and more aggressive content in the ads as well," he says. "I have heard a lot of feedback that customers want us to be more visible. We will do that." Still, he cautions, "We will not become perfect. I expect to see significant improvement. We have metrics in place that we track and we will watch them very closely."

Customers will watch also. Copeland observes that the logical result of the pressures of open systems will be fewer differences from one vendor to the next as they seek to control their costs. "As the differentiators between systems become minimal because of open systems, one has to look at why customers will stay with a particular hardware vendor," she says. "Customer satisfaction will become the critical component in customer loyalty." Such are the lessons of costly costs. ■

WHEN YOU RIGHTSIZES WITH OUR ACCOUNTING AND HR SOFTWARE, IT'S SMOOTH SAILING.



Rightsizing opens the way to greater productivity. But only Lawson offers the combination of products, policies and support that ensures smooth passage to your rightsizing destinations.

Rightsizing the world's best companies requires software with power and flexibility. Our mainframe-caliber, CASE-based software is easy to install and maintain. Our applications are priced based on the number of users, not CPU size. And our

unique open licensing policy lets you migrate from one Lawson-supported platform to another without additional license fees.

Our accounting and HR software solutions are available for HP 9000® and other UNIX®-based systems. We also have solutions for distribution and retail management. For case histories of companies that have sailed through rightsizing using Lawson software, call **1-800-477-1357, ext. 835**

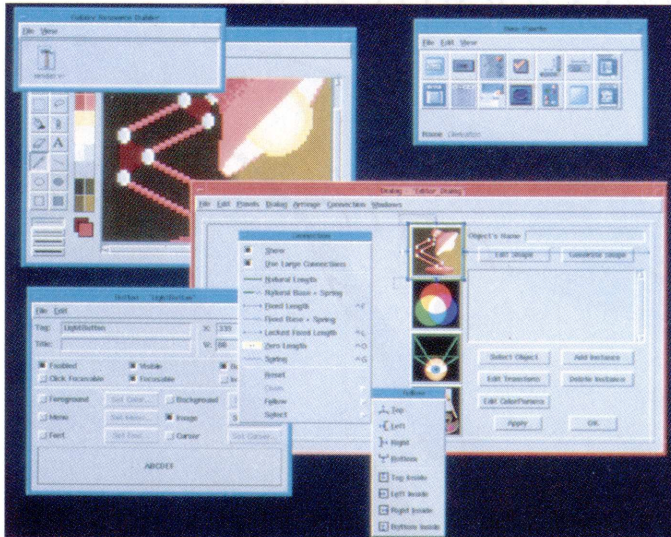
LAWSON
Software

UNIX is a registered trademark of UNIX System Laboratories, Inc. HP 9000 is a registered trademark of Hewlett-Packard Company.

S O F T W A R E F O R H P 9 0 0 0

CIRCLE 463 ON READER CARD

Across The Universe



*Visix Software's
Galaxy Lets
Developers Launch
Out-Of- This-World
Applications*

To develop a new application usually means you must buy into an operating system or hardware-specific environment, or purchase a variety of development tools from several vendors. Visix Software, however, now offers application software developers the Galaxy Application Environment — a development and runtime environment designed specifically for building large-scale, distributed graphical applications.

Applications developed with Galaxy run enterprise-wide across many desktop and server platforms, network and graphical interfaces.

Galaxy enables developers working on complex distributed applications to experience the equivalent of building a single-user Macintosh or Windows application. Galaxy replaces such toolkits as Motif, Macintosh Toolbox, Windows SDK and Open Look.

It provides a superset of the capabilities of these toolkits and enables Galaxy-based applications to be compiled and run across UNIX, OS/2, Microsoft Windows 3.1, Microsoft Windows NT, Macintosh and VMS platforms with no code changes.

Now you can stop worrying about compatibility and portability and concentrate on building the best possible products.

The Galaxy environment includes a graphical development tool set and a software tool backplane that is open to integration of third-party development tools.

The Galaxy Application Programming Interface (API) offers abstractions for the operating system, window system and networking functionality. Galaxy delivers high runtime performance by building on the very lowest system primitives available in each functional area.

Visix says more than 60 companies use Galaxy to build their next-generation software products. One such firm, Cadre Technologies Inc., is a CASE vendor that uses Galaxy to develop next-generation CASE tools. "Galaxy replaced our own internal code," says Rich Schire, senior software engineer. "It gives us a way to relieve ourselves of the platform-dependent code we have."

Galactic Portability

"Galaxy is a lot more than a graphical user interface builder," explains Jeff Barr, vice president of engineering

at Visix. When developing Galaxy "we looked at various workstations and the graphical programming we saw was not the stuff of which you build applications." Barr maintains Galaxy's portability environment helps set it apart in the industry.

The object technology used to develop Galaxy is extensive, and supports end user customization, as well as the future evolution of the Galaxy API and development tools.

Galaxy also supports the application runtime environment. Galaxy mediates at runtime between the system requirements of an application and the unique characteristics and limitations of particular system platforms.

With Galaxy, developers can build and deploy high-end graphical client-server applications without having to tailor different versions of the applications according to the strengths and weaknesses of particular platforms.

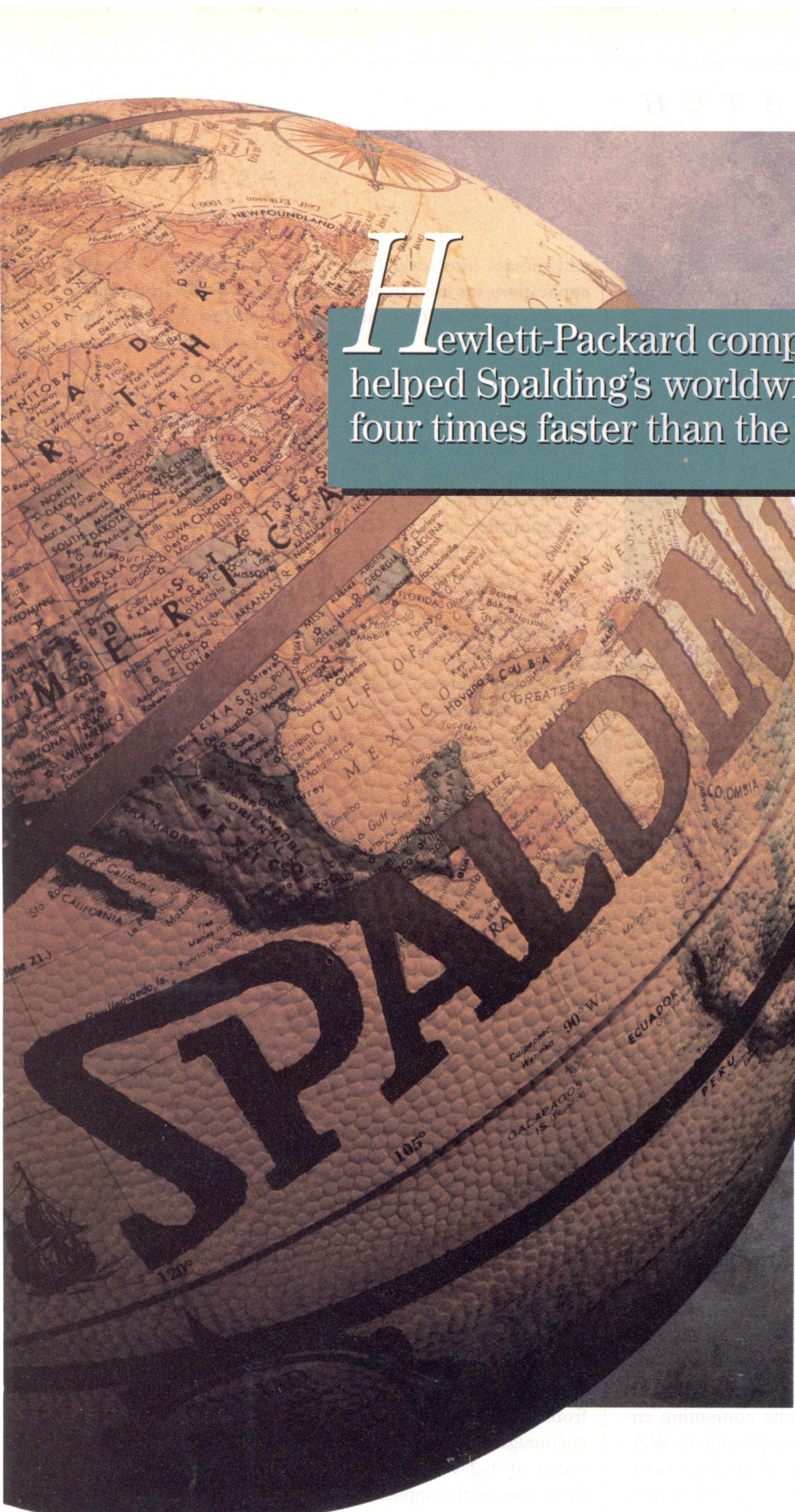
Galaxy's pricing ranges from \$7,800 to \$9,600 per developer seat, depending on platform, with no runtime costs. GSA pricing is available.

— Lonni Wright, Contributor

Visix Software

11440 Commerce Park Dr.
Reston, VA 22091
tel: (800) 832-8668
(703) 758-8230

CIRCLE 305 ON READER CARD



Hewlett-Packard computer systems helped Spalding's worldwide revenue grow four times faster than the industry average.

"Our HP 3000s have taken the worry out of daily operations and future growth. They leave us free to concentrate on customer service."

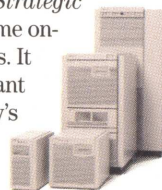
— Bard White, Spalding's CIO and
Worldwide Director of MIS

Instead of investing in mainframes, Spalding looked for a better way to manage its growing business. A way that would make the 115-year-old sporting goods company more responsive to customer demands around the world and save money at the same time.

So HP developed a networked solution built around powerful HP 3000 Business Systems in a dozen data centers and distribution hubs worldwide. This gives Spalding instant global access to management information, helping them react quickly to changing consumer needs, and deliver products faster.

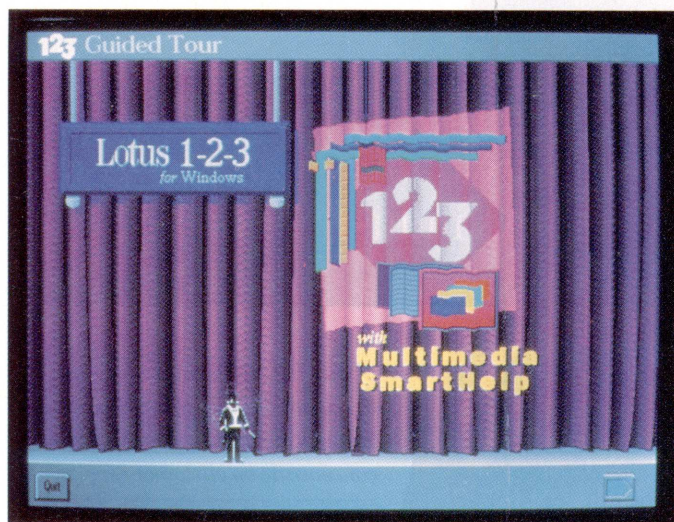
To learn more, call 1-800-637-7740, Ext. 7525 for our free video, *Strategic Computing*, starring some on-the-ball business leaders. It shows why you might want to rethink your company's game plan.

Think again.



**HEWLETT
PACKARD**

Class Act



*Multimedia
Training Software
From Lotus
Makes Learning
Its Spreadsheet
As Easy As 1-2-3*

Educators have known for decades that different people learn in different ways. Some, though not many, prefer to read books or documentation; others like to plunge right in and learn by doing. For still others, only seeing is believing. They like to watch how someone else grapples with the problem before they try anything on their own. With this in mind, it didn't take long for training specialists to recognize that multimedia, which can convey the same thing in a variety of formats — text, interactive media, video — was a natural for teaching people how to use computer software.

Lotus Development Corp.'s Multimedia Products Group is focused on bringing practical forms of multimedia to corporate computing environments through its Windows-based product suite. Lotus has incorporated multimedia capabilities such as digital text, sound, picture

and movies into several PC applications for users in education, presentation and communications.

Recently, the company introduced Multimedia SmartHelp for 1-2-3 for Windows. The product, which is delivered on CD-ROM, combines text, sound and animation to offer 1-2-3 for Windows users new ways to use and learn about Lotus 1-2-3.

Multimedia SmartHelp features a 40-minute animated and narrated guided tour, "Show Me" movies that interactively educate you about Lotus 1-2-3 concepts and procedures and Online Books, which are complete documentation files presented as books. Also included are animated demonstrations within the help system to provide just-in-time learning support.

Procedural "Show Me" movies present the steps you need to complete a task. A toggle feature displayed as a software switch allows you to switch between the Show Me movie and the spreadsheet you're working on so you can apply what you have just learned.

"An advantage of incorporating multimedia learning with Lotus 1-2-3 is that PC users now can learn while sitting at their desktop with work in progress. We hear from our customers that this encourages them to explore more of 1-2-3 and shows them part of the application they haven't used before, which inevitably increases

their productivity," says Rob Lippincott, director of product development for Lotus' Multimedia Products Group.

The server edition of 1-2-3 for Windows with Multimedia SmartHelp comes with a multimedia enabled release of CD/Networker, which enables you to share SmartHelp without having to equip all your desktops with CD-ROM drives.

For teachers interested in adding multimedia to their own pedagogical repertoire, the Multimedia Products Group also offers multimedia support through its FreeLance Graphics for Windows presentation graphics package. FreeLance now gives users easy access to multimedia tools for enhancing their presentations with show-stopping musical introductions, animated transitions, sound effects and full motion video. Lookout lunch-time training sessions!

Also included with FreeLance for Windows are Lotus Media Manager and Lotus Sound, which enable users to incorporate text notes, pictures, sounds and animated or video movies into their presentations.

Lotus 1-2-3 for Windows with Multimedia SmartHelp is \$595. Lotus 1-2-3 users can upgrade for \$150.

Lotus Development Corp.

55 Cambridge Pkwy.
Cambridge, MA 02142
tel: (617) 577-8500
(800) 343-5414

CIRCLE 307 ON READER CARD

Does Adager charge you a fortune when you migrate from MPE to MPE XL?

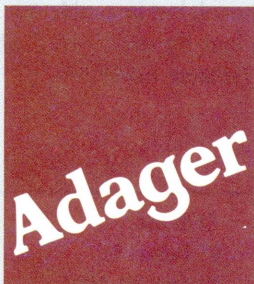
No. Adager treats all your HP3000 computers with the same care and respect, whether Classic (MPE) or Spectrum (MPE XL).

The same Adager software applies in all cases (with appropriate native-mode procedures for XL systems).

The same Adager price applies in all cases.

This is Adager's policy on XL, in effect since 1987:

- a) If you have an Adager license on a Classic machine and you simply get an **XL machine as an exchange**, there is no Adager upgrade fee at all.
- b) If you have an Adager license on a Classic machine and you get an **additional computer that happens to be an XL machine**, you simply pay the Adager fee for the additional machine.



The Adapter/Manager for IMAGE/3000 Databases

The Adapter/Manager for TurboIMAGE Databases

The Adapter/Manager for TurboIMAGE/XL Databases

Sun Valley, Idaho 83353-0030 U.S.A.

Telephone: +1 (208) 726-9100 or toll-free from Canada and U.S.A. (800) 533-7346

Fax +1 (208) 726-8191 Telex 40-3392 Adager EasyLink 6289-6060

Apollo Revival

SAR Systems Refurbishers Keep Domain Buyers Coming Back For More

"Every time we ship products, we follow up with a phone call to make sure everything is going well for the customer once the equipment arrives".

Christopher W. Baker,
Sales and Marketing
SAR Inc.

What do Phillips, General Electric, Martin Marietta and the U.S. Department of the Interior all have in common? Precious little, but all four recently bought reconditioned Apollo workstations from SAR of Haverhill, MA.

Stephen F. Baker, director of operations, and Christopher W. Baker, head of sales and marketing, work with a modest sized group at the HP, Apollo and Sun workstation resale firm that is part of what Steve Baker estimates to be a \$1 billion worldwide market for reconditioned HP computers.

"These companies can afford to buy anything they want, but they buy Apollo Domain," says Steve. "It's part loyalty to Domain and part preserving their investment in the software." It's also part saving money, and lots of it. For firms not yet ready to convert hefty investments in Domain software to HP-UX or some other operating system, picking up another Domain workstation is the much cheaper option. A reconditioned model that listed not all that long ago for \$31,000 can now be had for \$3,000. Reconditioned Apollo systems go for 10 to 50 percent of original list, HP Series 400 models sell for 30

to 40 percent of original list, and Series 700s that show up get snapped up at 60 to 70 percent of list.

And this is not one-time-only purchases — "First, they'll call me for a \$25 part, and I won't hear anything for a little while," says Chris. "Then it will be \$100, then \$1,000 and on up. And once you're in at these companies, you're in."

It's not quite that simple, of course — quality counts in the HP market, and just as much in reconditioned products as with the new stuff. "We guarantee our products will be picked up on any vendor's service contracts," says Steve. "When the systems arrive, we test them first, then disassemble them into components and store those. When an order comes in, we reassemble the systems to the buyer's specifications, test them for 24 hours and then ship them out."

When it's time to get products out the door, nobody has an office job in this organization. Front office people aid the technical crew with diagnostics, assembly and participate in assuring the products ordered are packaged and shipped on time.

Doldrums even may have helped their business. SAR itself started approximately 10 years ago with a contract to provide reconditioned Wang computers and parts for Wang itself. That portion of the business is alive and well, and two years ago spun off the relatively new venture into reconditioned Apollo,

HP and now Sun workstations. Last year, an expanded marketing effort in the face of hard times started to pay off. SAR now attends various user shows, including some in Europe.

In a business that expands in the face of a protracted poor economy, you might expect fierce competition. While in some portions of the computer industry, reconditioned equipment competition is strong, thus far, the HP market remains small, with fewer than a half dozen firms scattered around the United States; three of them are clustered in the New England area. Interestingly enough, SAR reports they get along well together. Tryonics of Portsmouth, NH and SAR regularly provide scarce parts to one another.

But as in all business, success ties back to the basics. "Every time we ship products, we follow up with a phone call to make sure everything is going well for the customer once the equipment arrives," says Chris. He reports returns on their products are less than one percent. "So far this year I've had one sales return, a video board, and the failure was not in the board, but in a cable not supplied by us." —Bill Sharp, Technical Editor

SAR Inc.

11 Rodgers Rd.
Haverhill, MA 01835
tel: (508) 521-6636
fax: (508) 372-0999

CIRCLE 357 ON READER CARD



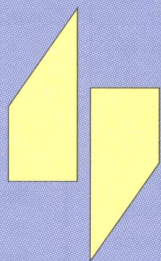
23:30

Lights Out
Operation

12 Tape Autochanger For Unattended Backup!

Herstal's DAT Autochanger provides up to 96 Gigabytes of **Unattended Backup** so you can enjoy a good night's sleep without worrying about who or what is backing up your data.

Available as an **upgrade to your existing HP DDS drive**, or as a subsystem containing HP's new 8 GB drive, our Autochanger is the perfect solution for your backup needs.



HERSTAL

3171 W. Twelve Mile Road
Berkley, MI 48072-1339, USA
Phone: (313) 548-2001
Fax: (313) 548-2010

CIRCLE 173 ON READER CARD

Open Upper Cut

*Lawson Takes On All Competitors
In Open System Applications Ring*



**We're more
interested in solving
business problems
than integrating
the bleeding-edge
technology.**

Dan Metzger,
Vice President
Marketing
Lawson Associates

Lawson is a survivor. A traditional heavyweight vendor of mainframe financial applications for more than 12 years, the firm now enters a new weight class. The Minneapolis, MN-based company comes out of its corner swinging, boasting an advanced business strategy for open systems computing that positions Lawson and its customers well into the future.

Today, approximately 40 percent of the \$40 million company's business comes from open systems, according to Dan Metzger, vice president of marketing for Lawson.

The company's most recent product release is Open Enterprise Version 6.0, a client-server implementation available on a range of server platforms, including HP-UX, with support for multiple relational databases and several client platform options.

Positioning itself as a viable vendor in the client-server market, a market industry analysts estimate to reach \$69 million this year, Lawson competes against such companies as Oracle Corp., PeopleSoft and Platinum, to name a few.

However, according to Mike Stringer, strategic alliance manager, Lawson's strong product mix in the areas of accounting, human resources and distribution sets

it apart as a market contender. "We offer a rich set of functionality from an enterprise-wide approach in a tightly integrated solution."

The company also developed a three-tier client-server architecture, or framework from which customers can build their client-server applications. Lawson's concept of layering the critical architecture components, which include application logic, database manager and presentation manager, allows the customers to strategically place the client-server components where they will be most effective on an application-by-application basis.

"We can run all three components on a single system or all three across different systems," notes Stringer. "We've taken an open systems approach to all the tiers," he adds. Another unique product feature is support for multinational currency, multinational languages and various international tax structures.

The lion's share of Lawson's new business comes from its strategic platform that targets HP's 9000 Series and IBM's AS/400 and RS/6000 systems. "We see great potential for growth on these platforms and have chosen to market heavily in these areas," says Stringer.

By offering an open licensing strategy, which allows the company's existing customer base to migrate free of charge to another platform, Lawson has seen many mainframe customers move

to HP-UX. "We've seen 500 percent increase in our HP business over the past year," Stringer says.

Bill Long, vice president and controller at Robbins Manufacturing Inc. (Tampa, FL) is one of those customers. "About two years ago, we replaced a small mainframe with an HP 9000 Model 842 as part of our rightsizing strategy," he says. "We felt that the industry was going in that direction."

A longtime Lawson customer, Long took advantage of the open licensing agreement and now runs all of Robbins' applications on Lawson software. "We briefly considered going with a different software vendor, but Lawson offered us the opportunity to migrate to HP-UX free of charge," he says. He also notes that because Lawson products are identical on various platforms the conversion occurred over a weekend and required little user retraining.

"Lawson's total focus is to provide solutions to business application problems. We're more interested in solving business problems than integrating the bleeding-edge technology, but if solving business problems requires new technology, we have it," says Metzger. — Lynn Haber, Contributor

Lawson Associates

1300 Godward St.
Minneapolis, MN 55413-1764
tel: (612) 379-2633
fax: (612) 379-7141

CIRCLE 306 ON READER CARD

Coming Soon

Reflection[®] X **for Microsoft Windows**

- Full X11R5-compliance
- 32-bit architecture
- Powerful implementation of FTP for Windows
- Integrated network transports

with Reflection reliability and technical support

 **Reflection[®]**

Making PC Connections Count

Walker Richer & Quinn, Inc.
2815 Eastlake Avenue East, Seattle, Washington 98102 / 206.324.0407 / FAX: 206.322.8151
Buitenhof 47, 2513 AH Den Haag, The Netherlands / +31.70.356.09.63 / FAX: +31.70.356.12.44
Reflection is a registered trademark of Walker Richer & Quinn, Inc.
All other trademarks are the property of their respective holders.

CIRCLE 127 ON READER CARD

The Introduction Of Windows NT Forces Major UNIX Vendors To Ally Themselves In A COSE Relationship

THE Peacemaker

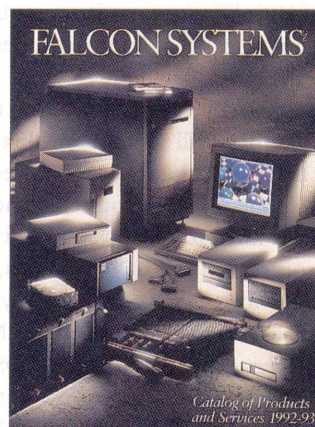
BILL SHARP

Mr. Four, Crackers and Sidney are indoor cats who have been sharing our home in what ranges from a Bosnian truce to all-out war. As of a few weeks ago, however, they get along very nicely. The reason for the cease fire? We got a dog. There is nothing quite like the bone-chilling fear instilled by an untamed six-week-old shepherd-lab mix to make docile house cats out of three pretenders to the feral throne.

Now that I think about it, the boys, as we call our male cats, are not that different from the major UNIX vendors, and the dog is Microsoft's Windows NT — a product with about the same potential to delight and infuriate as our Cheeka the Wonder Dog.

For several years, UNIX users have whimpered, simpered and whined for a less bewildering array of marginally compatible UNIX versions. UNIX vendors, seeing no near-term payback in cooperating with competitors, ignored demands for a single UNIX.

What user pleadings could not accomplish in years of begging, however, Microsoft did simply by introducing a competing product, Windows NT. After sniffing around the bushes,



NO OTHER COMPANY CAN MAKE THIS STATEMENT ABOUT HEWLETT PACKARD UPGRADES

Falcon Systems has everything you need to make your HP9000 workstation more powerful. And, it's all in stock and shipping 24 hours ARO. **Hard Disks.** 300 mb to 50 gb. Internal or external. Custom racks. Removable canisters. **Optical Disks.** Mammoth storage. Lightspeed access. Read-only or rewritable. Optical juke-box. **Memory Enhancement.** Board level & SIMMS. Lifetime warranties.

FALCON



Making Workstations Work Better
(800) 326-1002

Tape Drives. 9-track; 8mm; 1/4 inch; 4 mm stackers. **And more.** Scanners. Printers. Plotters. Displays. Everything you need to simplify your workstation work.

Backing it all up is FalconCare®, the unlimited, no-charge installation support program. Ask your Falcon rep for details. And, don't forget to request your free copy of our '93 Workstation Upgrade Catalog.

All brands, products and services mentioned are the trademarks or registered trademarks of their respective owners.

CIRCLE 110 ON READER CARD

Microsoft saw a rapidly growing, but badly fragmented market with a common need — a consistent operating system with UNIX-like capabilities. It saw lots of money waiting like some pile of doggie bones, and came frolicking over to take it away.

The UNIX cats, scared spitless, got together and created the Common Operating System Environment (COSE, pronounced “cozy”). To halt the growing throng of users ready to empty their wallets for NT, COSE members in March pledged:

- To support DCE, ONC+ and UNIX NetWare client services, which will help both users and ISVs.
- To develop standards for graphics, objects and multimedia capabilities.
- To jointly adopt OSF Motif and HP VUE as the basis for a common desktop environment for all UNIX applications on COSE-member UNIX platforms.
- To work out inconsistencies in system management across UNIX versions.

Why The COSE Cat Bed?

IF WE IGNORE NT FEARS for a moment, we need to ask why UNIX vendors would, after years of fierce cat fighting, get together and make purring noises. Gary B. Eichhorn, general manager of HP’s Workstation Business Unit, sees the COSE arguments driven by both customer and vendor requirements.

“If you talk to customers with UNIX workstations from multiple vendors,” says Eichhorn, “they will all tell you that one of their biggest problems is the inconsistent look and feel of UNIX. In this business, you’d better listen to your customers.”

Vendors also are beginning to listen to independent software vendors (ISV). “If you want some very vocal UNIX critics, talk to ISVs,” Eichhorn offers. “APIs for the desktop are very numerous, and it is very expensive to write to all of them. Now ISVs are smiling, but they were very burned up [before COSE].”

Of course, there is the competitive pressure. “Now there are alternatives to UNIX, such as NT,” he says. “We think we have superior alternatives, but UNIX has to also have commonalities to be worth going to.”

A common UNIX environment will entice more users to adopt the operating system. “Everything we can do that makes the market larger and still allows competition is good for HP,” says Eichhorn.

Joe Menard, vice president of marketing for UNIX System Laboratories (USL), agrees. “We recognize that by coming together we can make UNIX a better solution for customers, so quite frankly, our revenues will grow,” he says.

“We should have gotten together sooner,” says Menard with some regret. “The UNIX operating systems on the market are very, very similar as it is. The degree of difference has been grossly exaggerated.”

Larry Hambly, vice president of Sun Microsystems, says Sun

is “totally committed to what COSE is doing. We feel that the real answer to the UNIX problem is what we are all trying to accomplish: a common set of interfaces for a standard set of technologies.”

You can perceive Sun’s participation in COSE as either a sign of strength or weakness. Sun had more than 31 percent of 1992 workstation and server revenues and 38 percent of unit shipments. However, Sun will make what USL’s Don McGovern, vice president of corporate strategy and business development, describes as “the largest COSE member concession in porting to Motif.”

The Other Big Cats

COSE’S BENEFITS TO HP are significant. “COSE will be a real boon for us,” says Bob Weinberger, marketing manager for HP’s Workstation Business Unit. He predicts “substantial gains” for HP workstations and other UNIX products during 1993. In the workstation market, says Weinberger, “[because of COSE] Sun will have to switch from Open Look to HP VUE and Motif, which is where we are now. If customers want to get the new Sun user environment, they should buy an HP system. That is the bottom line.”

In his less aggressive moments, Weinberger, like other COSE types, says the COSE initiative is a reaction to “escalating customer needs.” COSE appears also to be a reaction to the escalating needs of COSE member pocketbooks, as their market slows in an economy that lately has been, well, a bit of a dog. Dataquest of San Jose, CA, reports that 1992 sales in UNIX workstations, generally one of the brighter areas of the computer market, failed to meet growth expectations. The market expanded at a modest 4.2 percent to just over \$9 billion in sales rather than the \$10 billion or more analysts had expected.

Although at this writing Digital was still straying from COSE, we found a clue to the firm’s intent in DEC’s gifted ability to walk the top rail on a high fence. Says Mark O’Connell, director of marketing for AXP personal systems, “We have not as yet decided to join COSE, but we stand for development of those industry standards.

“We are absolutely being pulled in two directions at once,” admits O’Connell. “We are basing our strategy on providing multiple operating systems and allowing our customers a choice. We are trying to do right for the industry without choosing sides. It is a fine line and one for which some will criticize us. We are betting on all of the horses.”

However, Digital has placed a side bet on one beast that stables in Redmond, Washington. Months ago, DEC pledged to support Windows NT on its workstation products. The company feels NT will cross the finish line first, and DEC can cash in big by being there, with roses in hand.

Digital’s hedging is understandable in the face of NT. Microsoft’s last desktop offering, Windows, is rapidly propa-



Are Your HP Users Complaining About Missing Their PC-Based Applications?

Now, SoftPC® adds Microsoft Windows™ and MS-DOS® applications to your HP-UX® workstation environment. On one screen, your users can run PC-based and HP-UX applications side-by-side at up to 486 performance thanks to Insignia Solutions' proprietary mouse and Windows drivers.

Your HP workstation users can share files between HP-UX and PC environments on HP Series 9000® workstations. They can even enjoy SVGA, VGA, CGA, EGA and Hercules graphics. Microsoft Windows 3.1 and MS-DOS 5.0 are pre-installed so they can get right to work using their favorite PC-based personal productivity applications, legacy systems, or HP-UX programs. You can please all your users — call Insignia Solutions today: 1-508-682-7600.

Reseller/VAR program available.

Insignia® Solutions
Bridging Worlds Of Software

Insignia Solutions Inc., 6 Campanelli Drive, Andover, MA 01810

Insignia Solutions, Ltd., Kingsmead Business Park, London Road, High Wycombe, Buckinghamshire HP11 1JU, UK. Fax +44 494-459720. Call +44 494-459426.
SoftPC is a registered trademark of Insignia Solutions. MS-DOS is a registered trademark and Microsoft Windows is a trademark of Microsoft Corporation. HP-UX and HP 9000 are registered trademarks of Hewlett Packard Corporation.

All other trademarks or registered trademarks belong to their respective holders.

CIRCLE 458 ON READER CARD

gating its way across the PC landscape. As PCs based on Intel's new Pentium chip begin to impinge on UNIX workstation turf, the reportedly UNIX-like NT operating system may be in a strong position to expand through both the PC and UNIX workstation markets.

This is a cause for real concern among UNIX vendors, and it should be, says Laura Segervall of Dataquest. In competition with NT, she says, the COSE effort "won't make much of a difference. COSE is too little, too late."

UNIX vendors, while not as gloomy as Segervall, clearly are concerned about NT. "We have potential competition looming out there," says USL's McGovern. "There are people in a Redmond, Washington building with something that looks and sounds like UNIX, and that's got our attention."

Says HP's Eichhorn, "There are tens of millions of Windows V3.1 customers out there, and we'd be crazy not to take NT seriously." However, he says, "those who have predicted NT the winner already are being a little premature, to say the least. COSE significantly enhances the attributes of UNIX in the fight for the desktop."

COSE's ultimate challenge, says McGovern, is to walk an innovation tightrope in formulating its common version of UNIX. "If in the end, all we do is converge on the lowest common denominator of interface technology and restrict innovation, then we will fail. The challenge is to agree on a core set of things that should be the same for all true UNIX companies,

things such as graphical user interface, windowing and operating system."

Time to accomplish the COSE goals will be short. Once NT arrives, the pressure on UNIX vendors will quickly mount to demonstrate superior capabilities or surrender to the new dog on the block. "I believe the COSE environment is one which is either serious and will be a go from the start, with significant milestones over the next 12 to 14 months, or will be more of the same thing as ACE and the other consortia of the past that didn't work out in the fragmented environment that UNIX is today," says George Weiss of Gartner Group, Stamford, CT.

COSE members are aware that the heat is on. "We want a common desktop environment available in the first half of 1994, and users want it this fall," says USL's McGovern.

Someday soon, Microsoft's Bill Gates, with a whimsical smile, will unleash his wild young NT dog on the UNIX felines. With much hissing and spitting and standing of fur on end, the UNIX cats will gather into a sort of protective group, to the benefit of users. In the meantime, while UNIX vendors are busy looking fierce, an immature NT-dog is going to make unsightly spots on our desktops. Who's going to housebreak this puppy?

Would you like to continue to see articles on this topic?

Circle on reader card

yes 350 no349

COSE's NOT-TOO-COMFY ORIGINS

"Whadaya mean, UNIX isn't UNIX?"

The complaint is nearly as old as UNIX itself. This operating system born and bred in university laboratories changed constantly from its early days. Unlike MS-DOS, handed down from on high by Microsoft when it feels like it, almost anybody with the software know-how could, and has, had a whack at UNIX code.

Unfortunately, once this labbie plaything became a viable commodity in the marketplace, it did *not* become more stable. Actually, computer and software firms played with UNIX further, developing their own favorite versions, always touted as far better than that of the competition, with names like AIX, ULTRIX, Solaris, OSF/1 and, yes, HP-UX.

Again and again users cried out for some conformity to a functional UNIX standard, and gradually, somehow, UNIX-variant vendors began to realize that something highly unusual, almost unprecedented was required of them — cooperation.

Here and there they cooperated on various ventures when there seemed just no other way, and they learned it was possible. Cooperation on a common UNIX has been going on in fits and starts. "These companies have been dancing with one another in pairwise fashion for years now," says Unix System Laboratories' (USL) Don McGovern, vice president of corporate strategies and business development.

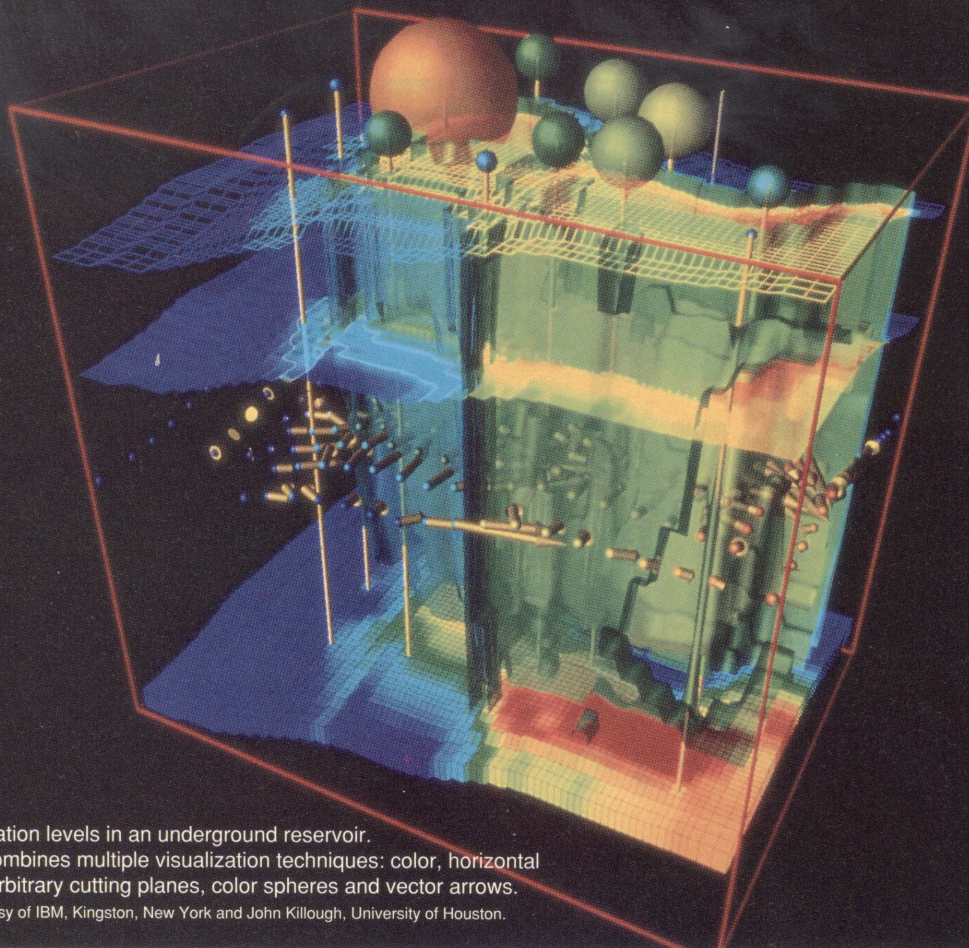
HP and USL had talks, IBM and HP met behind close doors, Sun chatted with HP, AT&T whispered in Sun's ear, while a bunch of them tinkered together on OSF. None of this did the trick. Then came news of Microsoft's Windows NT. With this news talk resumed — serious talk, and HP and IBM invited other firms to the discussions.

"I was apprehensive about the first meeting," recalls McGovern. Not only were HP and IBM there, but also his firm, USL, and its competitor, SunSoft. "In the end it was about as textbook a case of 'coopetition' as you could imagine," he says. Competitors worked together to create a common UNIX environment for weary users, each vendor contributing something and giving some ground.

NT's looming in their near future forced their hands, and participants rationalized that "the UNIX opportunity is much bigger than we would have predicted," says John Hulz, director of technical workstation marketing for IBM. "The market is growing so fast that all of us will be able to grow pretty aggressively for quite a while before we consume all the available opportunities."

And so, wallets assured safe and sound, they settled down to work together on COSE. — B.S.

FREE TRIAL OFFER



Oil saturation levels in an underground reservoir. Image combines multiple visualization techniques: color, horizontal slicing, arbitrary cutting planes, color spheres and vector arrows. Data courtesy of IBM, Kingston, New York and John Killough, University of Houston.

Make your workstation think it's dreaming.

Try IBM Visualization Data Explorer, the advanced visualization software for your SGI, Sun, HP or IBM RISC System/6000™ workstation... *free for 60 days.*

IBM Visualization Data Explorer gives you new control over your data...and new insights into their meaning. Yet Data Explorer is easy to use because it lets you visualize data in ways you've never dreamed of—without getting bogged down in the technology.

Here are just a few of the things you can do with Data Explorer:

- Freely combine different visual techniques within the same image.

- Quickly correlate data from various sources, such as simulations and observations, and view them together.
- Directly produce exciting animations from time series without production nightmares.

Data Explorer also has a powerful, extensible tool kit that provides fast access to a broad range of sophisticated functions, both visual and computational.

Whether you're a visualization novice or expert, you can try Data Explorer on your workstation, free for 60 days, no strings attached. **Call: (800) 388-9820.** Or write IBM Visualization Systems, T.J. Watson Research Center, P.O. Box 704, Yorktown Heights, NY 10598.

THE Standard Excuses

As Industry Standards And The Bodies That Create Them Proliferate, Open Systems Has Become A Bureaucratic Maze Of Acronyms And Stop-Gap Solutions — The Trick Is Doing What You Can With What You've Got

The key to developing open systems is standards. Without standards, there's no way to put together all the pieces needed to get those systems working together. So we've got standards. Lots of 'em. By most counts, probably too many.

We have standards coming at us from every direction. We have standards for languages, database access, operating systems, graphics, user interfaces, networks and system management. If there was only one set of standards, things would be fine. The problem is that there are competing standards in all of these categories, and many of them are mutually exclusive. How do we — or for that matter, our vendors — decide which standards to get behind?

This has been a real problem for HP shops. While claiming for years to be a standards-based, open systems sort of company, HP has done an awful lot of dancing for its customers. A member of every standards organization under the sun, including a few it has started itself, HP has been no more, or less, successful than any other vendor in implementing standard or open systems. Every HP system follows some standards, but not

GORDON McLACHLAN



Now you can add workstations to your Domain/OS or HP-UX environment at only a fraction of the list price.

That's what remanufacturing is all about. Recent model, lower cost equipment that runs like new because it has been rebuilt. From the ground up. To manufacturer's specifications.

Literally manufactured a second time. By **Tryonics**,

**Why
pay
more
?**

the people who know how to optimize these systems for your installation—new or existing.

Tryonics delivers the highest quality remanufactured workstations on the market today. Backed with technical expertise, full 90-day warranty and eligible for manufacturer's maintenance contract.

Before you pay more, call
1-800-551-6236

 ***tryonics inc.***

Workstation Computers and Services

CIRCLE 477 ON READER CARD

necessarily the same standards as other vendors — or even other HP systems — use.

Part of the problem is that full-line vendors have to look at the whole picture. They sell hardware, software and services. Any standard could potentially hammer one or all of those profit centers, and a standard that works great for users may not do much for vendors.

De Jure Is Out

ONE LESSON WE'RE LEARNING is that legislated standards don't cut it. If you look at the real standard products we're buying and using, you'll find a fairly short list, and in almost all cases, the technology was implemented before the standard was set.

Traditional standards organizations like the International Organization for Standardization (ISO), its U.S. representative the American National Standards Institute (ANSI), and the International Telephone and Telegraph Consultative Committee (CCITT) like their solutions to be thoroughly architected before anyone starts putting code together.

Open only to large organizations with a heavy vested interest — like governments and phone companies — ISO, ANSI and CCITT live in a fantasy land far removed from the reality of the marketplace. Because of the nature of their committee-ridden bureaucracies, ISO, ANSI and CCITT will release no specification before it's time has gone. About the only thing of lasting value to have emerged from the ISO Open System Interconnect (OSI) standards thus far is the X.400 electronic messaging standard, and the related X.500 directory services. Unfortunately, the enormity of birthing these behemoths has made their gestation period somewhere around eight years.

Taking that long to implement a standard is a real problem when you consider how short the life of any computer technology really is. What are you doing now that you were doing the same way eight years ago? Along their long path ISO sort of missed local area networks and network management, which gave the market over to TCP/IP and related technologies. As Homer Simpson would say: "Doh!"

Standards always will lag technology, but things are moving too fast to tolerate that kind of lag. To get by this obvious problem, some standards groups try to create standards and usable implementations at the same time.

The Internet Engineering Steering Group (IESG) guides the development of standards for the Internet, the quasi-governmental network of networks that gave us TCP/IP and all the related toys. Before a standard will be accepted by the IESG, it has to be fully implemented and tested by a working group of the Internet Engineering Task Force (IETF).

The IESG and IETF are peculiarly democratic institutions with a good track record of usable standards. Without a com-

mercial or political ax to grind, Internet standards aren't as fancy and feature-rich as some, but they work, and they're cheaper than most.

The Open Software Foundation has a more capitalist bent, being the result of a knee-jerk reaction against Sun and AT&T forming the Unix International Consortium in 1988. Still, OSF's best selling point is that it doesn't just endorse technology, it implements it. It costs a few bucks to join the club, but you don't just get a sheaf of specifications for your money, you get actual working code.

Even with a streamlined standards development process, standards bodies aren't guaranteed to be successful. Any standards body coming up with a proposed new standard still has to face the marketplace, and there is no crystal ball that will tell vendors which standards will pass muster with buyers.

OSF has proven that you can't just throw a standard against the wall and make it stick. While the Motif user interface is a hit, and the Distributed Computing Environment shows promise, the OSF/1 UNIX-derivative operating system is a flop, their Architecture Neutral Distribution Format (ANDF) for shrink-wrapped UNIX software distribution never made it out of the gate, and the Distributed Management Environment balloon seems to be losing gas, fast.

Learning De Facto Life

DE FACTO OR INDUSTRY standards crop up when a proprietary product is so widely used that other vendors can't ignore it. On one hand, implementing a de facto standard is less of a risk for vendors, because they already have a good idea of its market acceptance. The problem is integrating de facto standards into that big picture. De facto standards make it harder for vendors to come up with overarching architectures and environments for their product lines. De facto standards tend to be very narrow in scope, and fitting them together with other pieces to provide a total solution isn't easy.

On the other hand, the success of standards seems inversely proportional to their scope and complexity. It's axiomatic that it's easier to standardize a component piece of something than a whole assembly, and the KISS approach has obvious advantages. Still, vendors do have to think ahead if they want to have well-integrated solutions available, so the lure of the big standard is often too strong to ignore.

X/Open is a consortium of users and vendors that tries to put de facto standards into some sort of big-picture perspective. While X/Open doesn't develop new technologies per se, it does take existing industry offerings and codifies them, trying to impart some order to multivendor architectures. The resulting systems might not be as seamless as something developed from the ground up, but they do have promise. X/Open specifications carry a lot of weight in Europe, and appear on many



Is Finding Your Hardware Solutions an Upstream Battle?

While other companies offer
solutions...at CMI we *deliver*.

For quality, support, and
100% customer satisfaction
call today!



CMI

Computer Marketing International, Inc.[™]

800-497-4264 ♦ 508-687-3700 ♦ Fax 508-687-4395

COMPUTER MARKETING INTERNATIONAL, INC., 85 FLAGSHIP DRIVE, NORTH ANDOVER, MA 01845 USA

© 1993 CMI, INC.
CIRCLE 454 ON READER CARD

users' open systems wish lists. Accordingly, vendors and other standards groups like to see X/Open pick up on their stuff.

One of the best endorsements of a standard (de jure or de facto) is its appearance as a U.S. government Federal Information Processing Standard (FIPS). If something shows up as a FIPS, government agencies have to specify it when they ship off a request for proposal, and vendors have to supply it if they want a spot at the trough.

Of course, FIPS-compliance may not mean anything at all to you. If POSIX-compliance and an X.400-based mail system aren't high on your list of important things to worry about, specifying FIPS in your own system won't buy you much.

The dream of all vendors is to come up with the hardware or software pieces that everyone else has to adopt as a standard. Microsoft and Intel are in the catbird seat because they own something of which everyone else wants a piece. Each and Every hardware and software vendor wants exactly the same lock on the market as these two. They also know they won't get there by playing follow the leader, and implementing other folks' standards.

One result is that vendors are increasingly banding together in consortia to fight off de facto standards they don't like. The latest example is the Common Open Systems Environment

(COSE) group formed by HP, IBM, Novell, Sun and others to develop a UNIX countermeasure against Microsoft's success in the PC market. Driven by the fear that NT might be a bigger risk to the UNIX vendors than they are to each other, they're trying to put their squabbling behind them so they have a chance of fighting off the real enemy.

All in all, we're probably better off for all of the standards activity going on, even if there are no real open systems for the time being. The general movement of the industry toward interoperability is encouraging, even if we haven't yet seen the day of truly open systems.

As a buyer of standards, you still have to rely on your own crystal ball to tell you where to commit yourself. With all the confusion, you still can't count on the big "architectures" and "environments," but you can find pieces that work together reasonably well. Be happy with pieces, if you can get them to work properly. In the immortal words of the Rolling Stones, "You can't always get what you want, but ... you might find, you get what you need."

Would you like to continue to see articles on this topic?

Circle on reader card

yes 344 no 343

Disaster strikes...

How will YOU recover your
critical data?

MagicDisktm

System Software Solutions available for
VMS systems and UNIX systems

ResQue! - Realtime back-up of data across
a network without impacting transaction time

Shadowing - For data fault-tolerance and
improved disk read performance - a unique

RAID solution!

Memory Disk - A fast, temporary
software-based disk that improves
I/O operations



**Bear
Computer
Systems
Inc.**

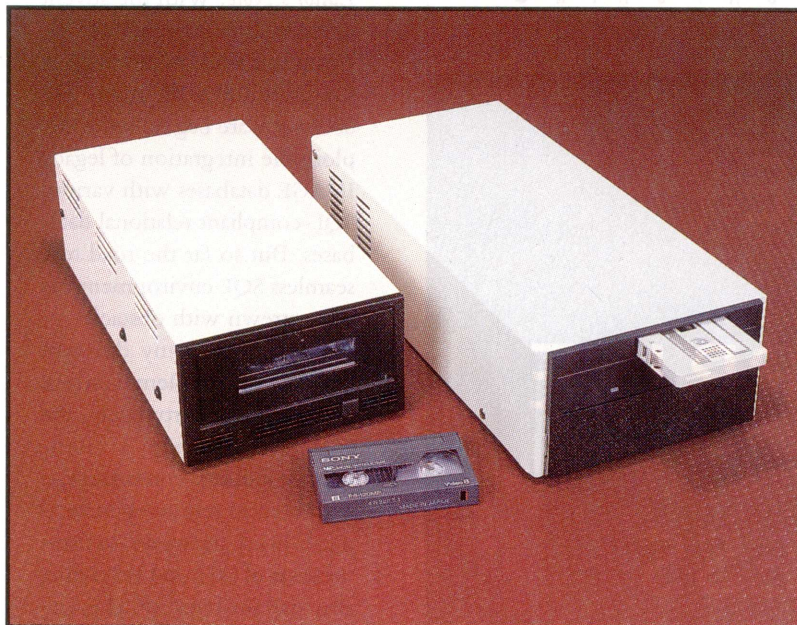
Call today for more
information about our free
product demonstration
package.

**9584 Topanga Canyon Bl.
Chatsworth, CA 91311**

**(800) 255-0662, ext.770
(818) 341-0403, ext. 770
FAX: (818) 341-1831**

CIRCLE 476 ON READER CARD

Why not the best?



HP 1000,
HP 3000 &
HP 9000

8 & 25 Gigabyte
Streaming Tape Drives

96 Gigabyte
DDS Autochanger

Unattended backup of
all data onto compact
cartridges

Media Translation &
SS update service
available

Also Available:

HP 1000 Memory

Improves system performance. Free evaluation.
2 to 32 MB for A990, A900, A700, A400,
A600+, & A600. Ten year warranty.
Field Expandable



HP 1000 & HP 9000 SCSI Disk Drives

Capacities to 2 GB with full five year warranty.

HP 1000 & HP 9000 Optical Discs

1 Gigabyte Rewritable & Multi-function. Ideal for
information retrieval and archival data storage

Superclock/1000 Automatic time & date

*"I promise you —
no service hassles, no
matter who is servicing
your HP system."*

Rick Walsh
President

HERSTAL

Automation Ltd.

3171 W. Twelve Mile Road
Berkley, MI U.S.A. 48072-1339

E-Mail SALES@HERSTAL.COM

FAX 1-313-548-2010

Phone 1-313-548-2001

THE ENTERPRISE ACCESS ROUTE

BY DAVID D. HIMES

The Road To Seamless Data Access

Across Heterogeneous Databases Has Been
A Bumpy One — But The SQL Access Group

Is Attempting To Smooth The Way

Editor's Note: With the advent of IMAGE/SQL — HP's SQL-compliant read/write interface for TurboIMAGE, many HP 3000 users are beginning to explore the integration of legacy IMAGE databases with various SQL-compliant relational databases. But so far the road to a seamless SQL environment has been strewn with obstacles — including the many different dialects and implementations of SQL itself. Fortunately, the SQL Access Group, a multi-vendor industry consortium, is dedicated to removing incompatibilities between various versions of SQL and extending the capabilities of the industry's only standard database query language. We thought you would appreciate this update on the workings of the SQL Access Group and its efforts to enrich the SQL standard feature set. — *Charlie Simpson, Editor-in-Chief*

The shift to client-server computing and enterprise data access has accelerated the demand for interoperability and portability of development environments and applications. End users of open systems want to access data stored by different data management systems across a variety of computing systems. The SQL Access Group has been at the forefront of the effort to deliver true heterogeneous data access based on accepted standards. For both vendors and users alike, data management systems built on these specifications for interoperability and portability deliver increased access to enterprise information at reduced cost. By reducing the costs for the development, deployment, train-



The Power of Integration

Unlock your HP3000 with DataExpress

If your end users can't reach the data they need, reach for DataExpress, the link you've been looking for between your HP3000 and Mac/PC desktops.

With DataExpress, users can pull information off your HP3000 without rekeying and without tying up your MIS people.

Best of all, they can bring data into PC and Mac applications that they already know and count on: Lotus, dBase, Excel, WordPerfect and more. With thirty output format options, DataExpress opens your data to more applications than any other integration package.

In addition to PC and Mac file formats, DataExpress can generate reports, and with the Report Designer option you get WYSIWYG capability, so you can see design improvements as you make them.

DataExpress is the #1 End-User Computing Environment available for the HP3000 today.

**For powerful solutions,
call 1-800-ANSWERS**

Your Integration Software Supplier®

M. B. Foster Associates Limited
50 Water Street
P.O. Box 580
Chesterville, Ontario
Canada K0C 1H0
Tel (613) 448-2333
Fax (613) 448-2588



ing and maintenance of applications, the market for information technology will continue to grow at an accelerated rate.

Standards are vital to achieve the goal of open systems. The SQL Access Group has worked to accelerate the standardization of database access including the query language (SQL), the interfaces to the SQL environment, and the communications protocols between database clients and servers. Each of these components is necessary to achieve true interoperability of SQL clients and servers.

The SQL Access Group, a consortium of 40 software and system vendors, was formed in 1989 to accelerate standards development for interoperable and portable access to database systems in the open systems environment. SQL Access Group has now completed, or is nearing completion on specifications in these areas: SQL language, embedded interface, call level interface and data access protocols. Although not a standard-setting body itself, the Group has influenced standards development by accelerating the pace, increasing the quality and developing new technology.

The SQL Access Group accelerates the process of standardization by assembling leading industry experts in the field of relational technology and holding meetings more frequently than is possible in the official standards organizations. The quality of the specifications is insured by their implementation by mem-

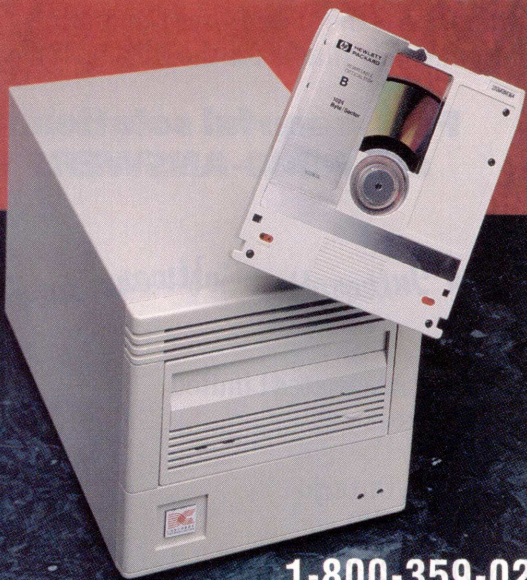
ber companies who then feed this knowledge back into revisions of the specifications. The group has also contributed to the development of new technology, such as the specification of a call level interface (CLI), where this had not previously been standardized.

Where Standards Come From

SQL ACCESS GROUP SPECIFICATIONS go through three stages of development. The first step is called a snapshot. At this level, the specification is published to get feedback from a wide distribution, but there's no guarantee of technical stability. The second stage is a preliminary specification, which is considered to be technically stable. The final publication, a Common Applications Environment (CAE) Specification is published after implementation by several members and any remaining problems have been corrected. The specifications are published jointly with X/Open Ltd., an international consortium of vendors and users that promotes open systems.

Probably the most important standard for SQL database interoperability is the SQL language itself. Although it is commonly believed that there is only one SQL language, there are many different SQL dialects. This means that it is difficult to

HP OPTICAL FOR LESS!



1-800-359-0282

High Performance Multifunction Optical Disk Drives

HP's new 1.3GB and 650MB multifunction drives offer hard disk performance with removable media at a very low price. Designed for use in either rewritable or WORM (write once) applications such as backup, archive/hierarchical storage, electronic image management and classified data applications. Call us today for more information on our complete line of HP enhancement products at (800) 359-0282!

- 23.5ms avg seek time, 14.3ms effective seek
- 1.3GB & 650MB storage capacity on either rewritable or WORM media
- 1.6MB/sec read, 500KB/sec write performance
- Supports HP Apollo 9000, Sun, IBM RS/6000, DEC, SGI, MAC and PCs
- Rugged removable optical cartridges offer long, maintenance-free shelf life
- 10.4GB to 188GB optical disk library jukebox versions also available



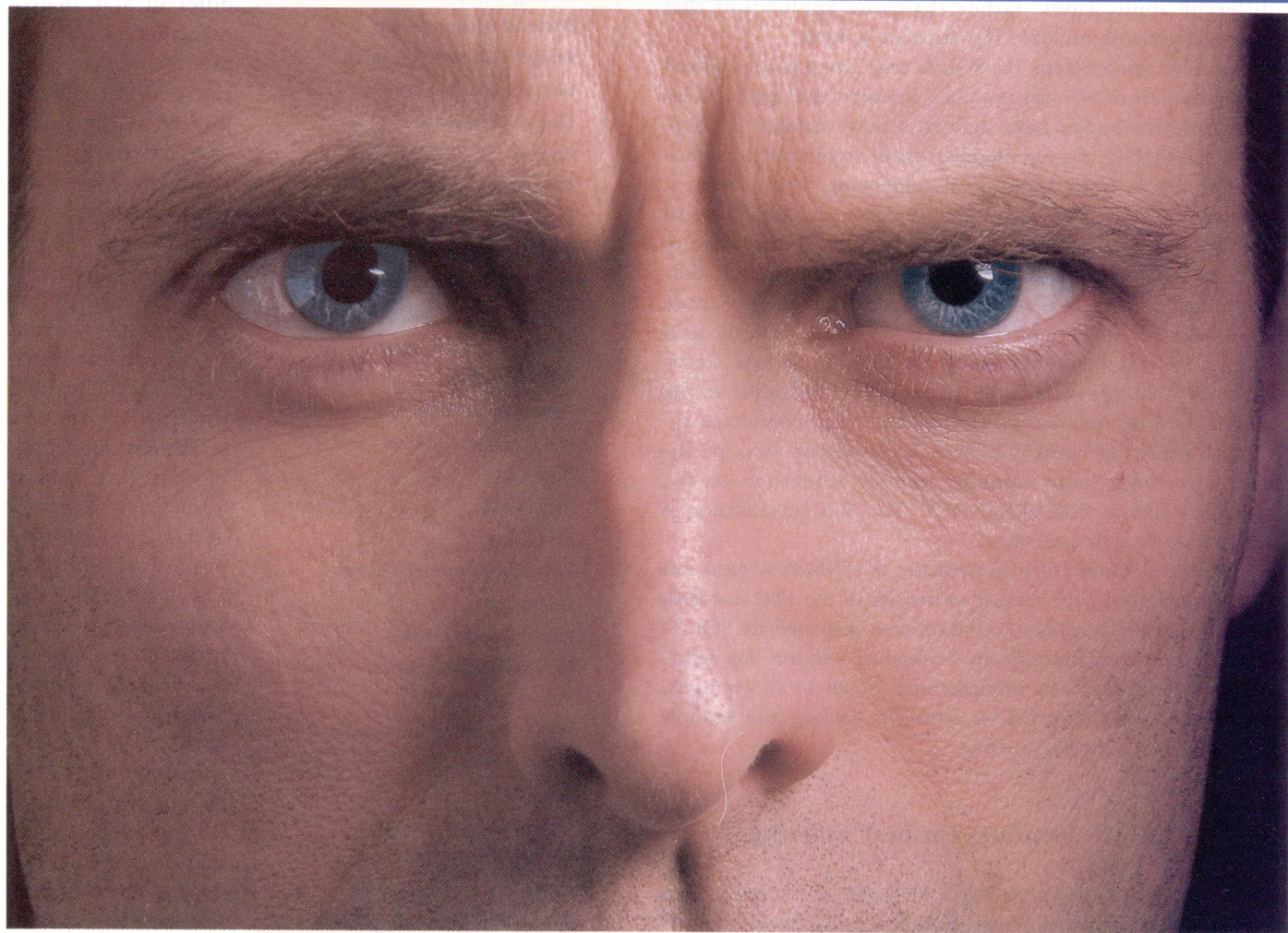
Concorde Technologies

7966 Arjons Drive, Suite B-210
San Diego, CA 92126
(619) 578-8750 • (800) 359-0282
FAX: (619) 578-3188



CIRCLE 232 ON READER CARD

Serious Demands Demand A Serious 4GL.



Focus from Information Builders. The 4GL for Serious Information Systems.

If you're facing demands that require the productivity of a 4GL, don't waste time with products that deliver only part of the solution. Because now there's a single high performance, high productivity 4GL that meets all your serious information needs.

It's called FOCUS. It's the world's most widely used 4GL, and it can do it all.

Client/server functionality, cross-platform portability, scalability and total data access

on any platform makes FOCUS the most comprehensive productivity tool on the market today.

FOCUS also provides complete application development facilities, unsurpassed reporting, ad hoc queries and powerful end-user tools. No other single product offers such a comprehensive range of enterprise-wide solutions.

Therefore, if you're serious about your

strategic information systems, you owe it to yourself to find out more about FOCUS, The Serious 4GL.

For more information or to attend a FREE seminar...

CALL 800-969-INFO

In Canada call 1-416-364-2760

IBI  **FOCUS**
Information Builders, Inc.

port an application written for one SQL database to another and interoperability is not possible. Many of these differences appear minor, such as different error codes, or differences in how or when validation is done. Unfortunately, when converting an application to use another database system, the changes are often subtle and difficult to find. When complete, there are two different applications, rather than one application that interoperates with multiple SQL database systems.

To solve this problem, the SQL Access Group has completed a specification of SQL for portable, interoperable applications. The standards bodies have defined a new standard for SQL known as SQL 92. Group members made significant contributions to the standard during its development. The standard is divided into three levels: entry, intermediate and full. The goal for the entry level of SQL was to provide a level that was very close to the previous standard SQL 89 with some minor additions. The distinction between intermediate and full was made on a feature-by-feature basis. The Group started with the goal of interoperability and portability and thus has defined a profile of SQL 92 that includes all of entry level and some of the components of intermediate and full that were considered essential to meet the goal. The SQL Access Group SQL specification includes some common vendor extensions to the standard, such as CREATE INDEX. The SQL specification is now in the final or CAE stage.

The development of major releases of RDBMS systems can span several years, and because of the size of the 1992 standard, it may be many years before full or even intermediate SQL 92 is implemented by the majority of database vendors. By defining a profile that can be implemented sooner by the vendors, the SQL Access Group has set a realistic goal for the vendors that delivers significant benefits.

RDBMS Vendors Embed Together

ANOTHER MAJOR AREA WHERE SQL Access Group has made a major contribution is in call-level access to SQL. By far the most common way to access an SQL database is by using host language embedding. SQL is embedded in a program written in a language, such as C or COBOL. A preprocessor generates a new source program in the host language, with the SQL statements converted to subroutine calls with parameters. The preprocessed source is then compiled with the host language compiler. The resulting binary is bound with a database access library to access the database.

Although the original embedded SQL source program may be identical, the output of each database vendor's preprocessor is different. This causes problems for tool vendors who would like to have their application run with every SQL database system. Today, they need a different version of their application for every database. In certain environments, such as "shrink wrapped" software, it is not feasible to rebuild the application for multiple ven-

STANDARD ROLL CALL: PRESENT MEMBERS OF THE SQL ACCESS GROUP

Apple Computer
Boeing Computer Services
Borland International
British Telecom Research
Bull HN Information Systems
Cincom Systems
Cognos Inc.
Computer Associates
Computer Corp. of America
Digital Equipment Corporation
Du Pont Information Systems
Fujitsu
Fulcrum Technologies
GUPTA Technologies
Hewlett-Packard
Information Builders
Informix
Ingres/ASK
JYACC Inc.
Lotus Development Corp.
Metaphor
Micro Decisionware
Microsoft Corporation
Mimer Software AB
MUST Software International
NCR/Teradata
Novell Inc.
Oracle Corporation
Progress Software Corp.
Retix
Revelation Technologies
Samsung Adv. Institute of Tech.
SAS Institute Inc.
Siemens Nixdorf Info. Systems
Sybase
Tandem Computers
Unisys Corporation
VMark Software

dors. In these environments, the runtime library supporting the interface to the SQL environment can be dynamically loaded with different SQL implementations to deliver interoperability. This can only be accomplished if the interface between the application or tool is the same for multiple implementations.

To solve this problem, the SQL Access Group started work on a Call Level Interface (CLI). This CLI would provide a common mechanism for accessing database systems from a host language, without using a preprocessor. The Call Level Interface describes subroutine calls, parameter lists, subroutine sequencing, state tables and diagnostics mechanisms. This specification has benefits to both tool and database vendors. Tool vendors can write one copy of their application and expect it to work with different database systems. Database vendors benefit when more tools and applications work with their systems.

The CLI is now available as a snapshot. This will become a preliminary specification in the late summer 1993 time frame. If the Preliminary Specification is found acceptable, it will be published as a final or CAE specification in late 1993.

The CLI also has been accepted by the ANSI Database Language Technical Committee (X3H2) as a change proposal for inclusion in the next major SQL standard, known informally as

With true client-server
interoperability, a single SQL client
implementation can be used
interchangeably with different
SQL servers.

SQL3. In addition, the International Organization for Standardization (ISO) has accepted the CLI as an item of interest, the first step toward international standardization.

The SQL Access Group CLI already is successful, even before it is completed. Both ODBC (Open Database Connectivity) from Microsoft and IDAPI (Integrated Database Application Program Interface) from Borland are based on the CLI specification.

Although the SQL Access Group CLI provides better application interoperability than host language embedding, it still requires the expense and maintenance of multiple runtime libraries. With true client-server interoperability, a single SQL client implementation can be used interchangeably with different SQL servers.

Remote Possibilities

THE THIRD SQL ACCESS group specification defines a common data access communication protocol. Data access protocols are called FAPs (Formats And Protocols). Client-server database systems in use today use proprietary FAPs to request data from database servers. Using a transport protocol such as TCP/IP or IPX, each vendor has a proprietary way for sending the SQL, data descriptors, and the data from the client to the server. Today, if a client needs to access two different servers, it must use two proprietary FAPs, one for each server. This complicates the client and wastes resources. Alternatively, a gateway is sometimes used. Gateways can be expensive, are often slow, and sometimes do not map the full SQL of the client to the server.

To provide a better alternative, the SQL Access Group has defined a common FAP for client-server interoperability in its Remote Database Access (RDA) specification. Using this approach, a client can access several different servers using a single communication protocol and no gateways because all servers, even from different vendors, understand the same protocol on the network.

This specification is based on the ISO SQL RDA protocol. The ISO RDA standard is designed to support SQL 92 Entry Level. The SQL Access Group RDA specification is extended to include support for the added features of the SQL Access Group SQL specification. It is currently available as a prelimi-

nary specification and will be published in final CAE form in the summer of 1993. SQL Access Group members contributed greatly to the RDA specification through their prototyping work. The additions to ISO RDA for intermediate and full features are being taken into the official standards bodies as proposals for inclusion in the next ISO RDA standard.

RDA is based on OSI protocols, and the current SQL Access Group specification only supports OSI. There is interest in a version or mapping of this specification for other protocols, such as TCP/IP. The SQL Access Group will soon offer a specification for TCP/IP. Research is planned for other transport mechanisms as well.

Building SQL To Specs

THESE THREE SPECIFICATIONS — SQL 92, the CLI and the RDA — provide the basis of interoperability and portability. The SQL specification defines the query language and the embeddings for C and COBOL. The CLI specification provides an alternate interface to the embedded interface and relies on the SQL specification for the syntax and semantics of the SQL queries. And the RDA specification adds the standard communications protocol to deliver full interoperability of SQL clients and servers.

As can be seen, the current specifications are close to completion. However, the SQL Access Group remains active. The specifications will not be successful without a way to ensure that implementations conform to the specification. Work is underway to define requirements for conformance. As vendors implement SQL 92, the subset for portability will change, and the Group's specifications will change as well. Additionally, there is interest in distributed transactions, stored procedures, and other features to make interoperable applications more robust. The SQL Access Group will continue to work to ensure that the open systems dream of enterprise data access becomes a reality. — *David Himes serves as the technical chairman of the SQL Access Group. He works for Cincom Systems in Cincinnati, Ohio as a product architect for connectivity and interoperability in the System Software Architecture Group.*

Would you like to continue to see articles on this topic?

Circle on reader card
yes 348 no 347

For information on SQL Access Group membership or ordering specifications, please call the Group's Headquarters at 603/434-0802.

Structured Query Language (SQL) \$70
SQL Call Level Interface (CLI) \$70
SQL Remote Database Access (RDA) \$62

The Seven Chakras Of Object- Oriented Programming

Let
Bhagwan
Bob
Enlighten
You
With
Inspired
Insights
Into
Inheritance,
Polymorphism
And
Other
Mysteries
Of
Object
Consciousness

It is said that Bob sees everything in terms of inter-related objects. This tended to make him a little hard to take at work, and vice-versa, so he left his job to form the Ann Arbor Center for Computing Consciousness, and became Bhagwan Bob, the Object-Oriented Guru.

The old Victorian house that serves as the Center's headquarters, its data center, and Bob's living quarters, is strewn with computer science texts and trade journals. Several empty pizza boxes stand next to an overflowing trash can and empty Pepsi cans line the wall, several rows high. A small group of young, saffron-robed acolytes sit around Bob in a loose circle, attentive as he holds forth:

"What are the Three Noble Truths of Object Orientation?" Bob asked suddenly.

In unison, the group responded: "All systems development is sorrow. Man can escape the sorrow of systems development. The escape from the sorrow of systems development is object orientation."

By Gordon McLachlan

"Very good, young people. That explains our goal. We want to escape the sorrow of systems development by achieving enlightenment in the ways of object orientation. The question is, how do we reach this state of enlightenment?"

"You will find that there are many paths to take. You must find the one that works for you, but beware of trying to find an easy path. There is no easy road to true understanding."

"The Yoga of Object Orientation is a Way to understanding. This disciplined meditation is a vehicle to the far shore of knowledge of object-orientation. Using it, we can harness our kundalini life-force and direct it through the seven lotus centers — or chakras — to reach the highest level of enlightenment about systems engineering."

"The kundalini is a coiled serpent resting at the base of the body in the first lotus center. In this place, which is called Mulhadara, 'the root base,' we are in state of torpor, and nearly asleep. The element that represents this chakra is earth. Here we are earthbound, unenlightened and unambitious. We code in FORTRAN and COBOL and C, and have but a vague yearning for better things."

"The second chakra is Svadhisthana, 'her favorite resort.' At this lotus, the serpent within is fully awakened and we begin to realize the difficulties and expense of writing good software. It costs too much to write code the old ways, and projects never get done on time. Here, we begin to see the problem, but not

its causes. We wish to act, but know not what to do because the serpent is not rational and is guided only by the most base urges."

"Those who achieve only the enlightenment of the awakened serpent search vainly for tools and methodologies with which to satisfy their immediate needs. At this level of consciousness, we have no understanding of the large forces at work in the world (and beyond) and our efforts are doomed to be puny. Canned code libraries and code generators tempt us, for we don't know any better."

Objects Of Desire

"THE THIRD LOTUS center is called Manipura, 'the city of the shining jewels.' The Five Jewels of Manipura include: Better Design, Localized Changes, Extensible Code, Reusable Code and Faster Development."

"The Five Jewels are what we seek, for they will give us better and cheaper systems. But it still remains to attain them. We have got but the briefest glimpse of them. How do we attain them and keep them, guarded as they are by gods and demons whose faces are unknown to us?"

"Just as there are many paths to enlightenment, there are

THE TOTAL SOLUTION

sales, service, support

On-time service, on-line equipment—backed by the GE name.

Black River takes the risk and worry out of ordering, implementation and maintenance. You're assured:

■ Full line of new and previously owned, refurbished 9000, 3000 and 1000.

■ Technically trained maintenance team.

■ Free installation with GE maintenance package.

■ Nationwide service backed by GE.

Call 216-365-9950 or fax 216-365-3916 for more information.



GE Computer Service

BLACK RIVER
COMPUTERS

THE TOTAL SOLUTION
sales, service, support

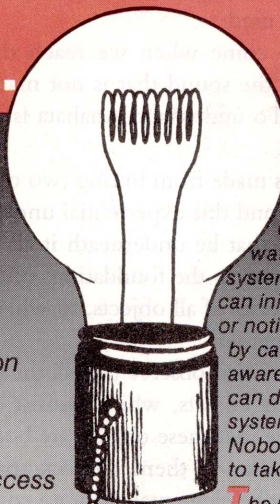
7630 RACE ROAD • NORTH RIDGEVILLE, OHIO 44039
216-365-9950

CIRCLE 171 ON READER CARD

Low Cost...

Lights Out!

- Crash or power fail detection
- User defined corrective actions
- Automate MPE command execution
- Local or remote notification
- Secured remote access
- Full console capability
- Message filtering



Go ahead, turn out the lights and go home with confidence. The Console Engine will dutifully keep watch on your HP3000 or HP9000 systems. It monitors system activities and can initiate user defined corrective actions or notify you by sounding a local alarm or by calling you on the phone. Once made aware of a problem, the remote operator can dial in, pass security and access the system with full console capabilities. Nobody will have to come in to the office to take action.

The Console Engine is the best low cost system attendant you can hire. Solid, reliable, always on the job the Console Engine lets you manage a single system or a network of machines. Rest Assured...



TELAMON has it handled!

492 Ninth Street, Suite 310 • Oakland, CA 94607-4098
(800) 622-0630 • (916) 622-0630 • (916) 622-0738 FAX

CIRCLE 234 ON READER CARD

THE WORLD IS NOT EASILY described in terms of the rows and tables of a relational database management system, nor in arrays of numbers. Object-orientation gives to us the Jewel of Better Design.

many weapons we may use to attain the Five Jewels, and tools to build our vaults for them. Object-oriented programming languages like Smalltalk and C++, and visual programming tools are the ways, as are object-oriented database systems. But just as we would not give a child a sharp blade, so we cannot be trusted with the weapons of object orientation until we are instructed and skillful in their use. This requires an understanding of both how and why they are used.

"This understanding begins to come when we reach the fourth chakra, Anahata, which is "the sound that is not made by hitting two objects together." To understand Anahata is to see the world as it really is.

"To our experience, all sound is made from hitting two objects together, but we must go beyond this experiential understanding, to discern the harmonies that lie underneath it all at the atomic level. We must look down to the foundations of all things to the elemental building blocks of all objects, to where no objects yet exist to be struck together.

"To understand Anahata, we must first observe that all things in the world can be represented as objects, which consist of data and code. Further, we must see that these objects are both separate from other objects and related to them. Objects may consist of other objects, or they may be elemental, with no constituent objects.

"Next, you will see that there is no fundamental difference between objects in programs and objects in databases. Object-oriented databases are just persistent object stores, which extend the life of programmatic objects and make them available for distribution to other users and programs.

"When we observe this, we no longer wish to model data and processes in the crude representations of traditional programming languages and databases. We strive to use a higher-

level system of ordering and classification that lets us solve problems more simply, and describe them in their natural 'language.' The world is not easily described in terms of the rows and tables of a relational database management system, nor in arrays of numbers. Object-orientation gives to us the Jewel of Better Design.

"Second, we see that it makes sense to group objects and the program code, or 'methods', that acts on them together. When we 'encapsulate' data and code in such a way, the objects are easier to understand. These objects are also isolated from one another so that changes to one do not affect what happens in another. This is very important because large complex systems are not easy to change without causing side-effects elsewhere in the system. This isolation brings us to the Jewel of Localized Changes.

The Many Faces Of The System

"AS WE BEGIN TO RECREATE the world around us from objects, we begin to see that, though each object is independent from all others, most objects share characteristics and behaviors with other objects in the cosmos. That is, these objects share some or all of their constituent data or methods with other objects.

"Inheritance' is what allows an object to take on data or methods from other objects, or to pass them on to subsequent generations of objects. Objects that share data or methods in this way can be grouped into object classes.

"Inheritance is a very important concept for object-oriented databases, because it allows a database schema to evolve gracefully, as changes are needed. If a new data descriptor or field is needed, a new object can be created from an old one, without disturbing the rest of the database. This is unlike a relational model where existing tables must be changed.

"Polymorphism, or the Many Faces of the System, is closely related to inheritance. Inheritance allows one object to share the methods of another. Polymorphism allows an object to substitute its own methods in place of those used by an ancestor. Thus the lion and the tiger may both roar, but in different ways.

"Together, inheritance and polymorphism together allow us to build the foundation classes on which all objects in the cosmos are based. These classes are the elemental objects from which all other objects will be built. We will have reached the Jewel of Extensible Code, and just below the foundation classes, we will hear the sound not made by striking two objects together.

"If our foundation classes are good, and at harmony with the cosmos, they will bring us to the last two jewels: Reusable Code and Faster Development. Although we feel close to our goals, there are still many obstacles to overcome. We will only see these clearly when we reach the fifth chakra, which is Vishudda, or 'the purification'.

"At Vishudda, we delve into the deepest mysteries of object-orientation, and confront the terrifying powers of the cosmos that present the final obstacles to our quest. Only by seeing the pitfalls in our way, can we clearly mark a successful path.

"First, we must contend with the karma that has attached to us from our previous lives and experience. A large investment in legacy systems, with their relational databases and procedural languages holds us back like a strongly blowing wind. Our object-oriented weapons, sharp blades as they are, cannot cut the Wind That Blows Against Change.

"If we try to use object-oriented programming languages like Smalltalk with existing relational databases, we see that the point at which they are joined is flawed. The row-and-table model of relational databases is not at harmony with object-orientation, nor is SQL. Even clever extensions to RDBMSes like stored procedures, table triggers and binary large objects (BLOBs) can't completely hide that flaw.

The Demon Of Time

"**P**ERHAPS THE GREATEST test we face is the Demon of Time within the Void of Infinite Design Iterations. "We enter the Void to find the form and substance of good and harmonious foundation classes and programming tools. We need foundation classes and tools for building user interfaces, to use networks, E-mail and databases, and for other yet undreamed of purposes. They must all work together in perfect harmony, lest they obscure the quiet sound not made by striking two objects together. Without them we are denied the Manipura's Jewel of Reusable Code.

"But it takes time to find good and harmonious foundation classes and tools. When we enter the Void, each object we find reveals another, in a progression that seemingly does not end. However, if we spend too much time in the Void we are denied the Jewel of Faster Development.

"All of these visions are terrifying, and each can be enough to turn back even a determined seeker of the Way of Object Orientation. We proceed then to the sixth chakra, which is Anja, the center of authority and command. Here, we open up the mystic inward eye, and experience the bliss that comes from the glory of seeing Object Orientation clearly.

"This is what the inward eye tells us: It'll be easier the next time."

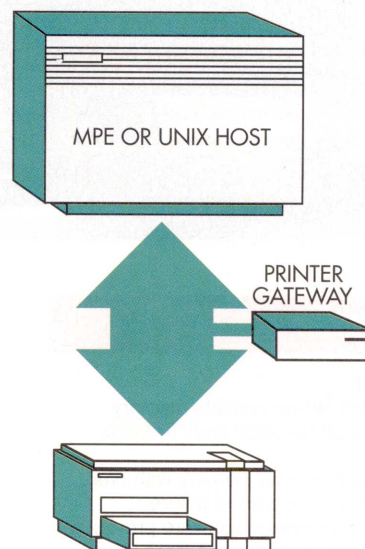
With that, Bhagwan Bob grew strangely intent and quiet, while the acolytes strained to hear his next words. After some pause, one of the acolytes asked meekly "But what of the seventh chakra, Bhagwan?"

Bob brightened visibly. "Glad you asked. Grab the pamphlets, and I'll explain on the way to the airport."

Would you like to continue to see articles on this topic?
Circle on reader card
yes 336 no 335

NBSPool Printer Gateway

For NetWare & LAN Manager



HOST TO PC LAN HIGH SPEED BI-DIRECTIONAL TRANSFER OF SPOOLFILES

FOR MORE INFORMATION OR A DEMONSTRATION TAPE CONTACT:

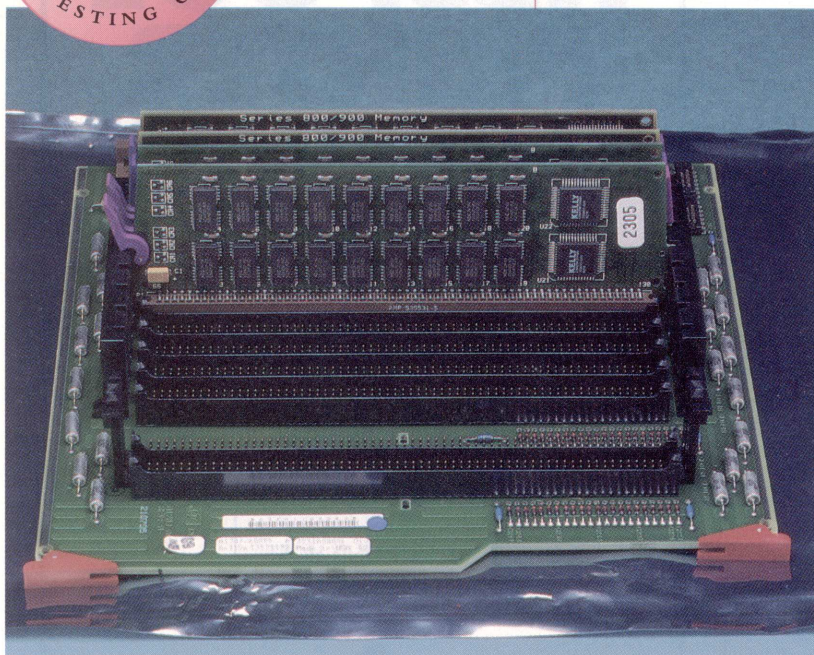
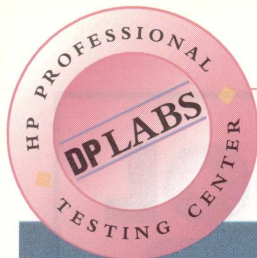


Quest Software, Inc 610 Newport Center Drive, Suite 890,
Newport Beach, CA 92660
Phone: 714-720-1434 Fax: 714-720-0426

In Europe Contact:

System Software (Int.) UK (44) 0905 794646
ORBIT (33) 40 25 16 50 France • (49) 30 852 7097 Germany
(31) 2979 41468 (Benelux) B.V.
(45) 42 335959 (Scandinavia) AB • (34) 372 360 333 UK

Vanguard Computer Services Pty. Ltd. (61) 2 888 9688 Australia



HP 3000 Memory Enhancers

KELLY MEMORY

OBSERVATIONS:

- 100 percent HP-compatible memory products, for all HP 3000 and HP 9000 systems.
- Lifetime warranty on memory with one day replacement in case of failure.
- Bundled performance software providing dynamic control of CPU resources (OVERLORD; available for HP 3000 only) and dynamic creation and maintenance of "solid state disk" (RAMXL).

PRICE:

Pricing of Kelly memory products depends on the platform and the memory array size. On an HP 3000/9x7 the price ranges from \$4,000 for a 32-MB memory array using 4-Mbit technology to \$25,600 for a 128-MB memory array using 16-Mbit technology.

PLATFORM:

HP 3000 systems, HP 9000 multiuser systems, HP 9000 workstations, HP LaserJet and InkJet printers.

Kelly Computer Systems

139 N. Whisman Rd.
Mt. View, CA 94043
(415) 960-1010
(800) 934-2000
(415) 960-3474 FAX

CIRCLE 303 ON READER CARD

Kelly Computer Bundles Performance-Boosting Resource Management Software With Add-In Memory Boards

Remember when a half a megabyte of memory was considered a lot? One megabyte? If you do, forget everything you thought you knew about memory because the times they have a' changed. PA-RISC, and especially PA-RISC with MPE/iX, has a rapacious appetite for memory. Case in point: A minimum configuration eight-user 917LX now comes with 32 MB of memory. This is twice the nominal maximum memory on the largest Classic HP 3000, the Series 70. And memory capacity can range all the way up to 2 GB on the Corporate Business Systems (It was not long ago that 2 GB of disk was considered a lot!).

Fortunately, for those of us managing computer systems, the price of memory has come down, and the quality has gone up — even as memory requirements have escalated. In some market segments, memory has virtually become a commodity, which means price is the only differentiating characteristic. So what can you say about add-in memory? Usually, not much — it either works or it doesn't.

Kelly Computer Systems (Mountain View, CA) stresses its commitment to product quality and its considerable technical experience in the HP market. However, Kelly seeks to differentiate its memory products from other vendors, including HP, by bundling performance enhancement software with its memory: RAMDISC on all HP 3000 and

John P. Burke

HP 9000 systems and OVERLORD (which includes RAMDISC) on the HP 3000/9xx.

We installed 32 MB of Kelly memory on our DP Labs' 917LX (increasing installed memory to 64 MB) to test the ease of do-it-yourself memory upgrades. We also installed Kelly's performance-enhancing software, OVERLORD and RAMXL (RAMDISC), and tested each in a variety of situations. Where possible, we will note where using Kelly memory and software on HP 3000 9x7 systems, such as the test system, differs from other HP 3000s and other HP systems.

The Hard Facts

Kelly memory is guaranteed 100 percent HP compatible. It supports full diagnostics, error correction and battery backup. It's fully compatible with MPE/iX and HP-UX and doesn't require system hardware or software modifications. Kelly memory is transparent to the system and does not affect maintenance agreements. Because Kelly has designed its own memory expansion card with more slots than HP's card, and can use 16-Mbit chip technology on the 9x7 and 8x7 systems, it's often possible to exceed HP's stated maximum memory limit.

Installing Kelly memory on HP 3000 9x7 or HP 9000 8x7 systems is simple — everything you need, including the special TORX screwdriver for the cabinet and a safety ground strap, is included. Kelly claims it should only take about 15 minutes to physically install its memory products in a Nova system. But first-time installers will probably require a little more time. The optional diagnostics and system backup will of course also add time. I spent about one hour, including the time spent running the diagnostics, installing 32 MB (a pair of boards referred to as an array).

The Soft Side

With each Kelly hardware product you buy for the HP 3000, you also receive two performance-enhancing software tools, OVERLORD and RAMXL. OVERLORD is available only for HP 3000 systems running MPE/iX and in-

OVERLORD adds significant value to Kelly's add-in memory modules by providing several tools for the system manager's toolbox.

cludes access to RAMXL, which is software for managing RAMDISC memory. While OVERLORD is not available on HP-UX systems, Kelly's RAMDISC software is available for any HP 9000 Series 300, 400, 700 or 800 system.

OVERLORD is both a resource-monitoring and performance-enhancing tool. With OVERLORD, you can monitor your CPU usage by class, by job, by session and by process. You also can create new classes defined in terms of a targeted minimum percentage of CPU time and manage the CPU resources that any class, job, session or process is getting.

Note that a class can exist by itself or can be defined as a group of sessions, jobs, or processes that meet certain membership criteria (rules), such as having an account name or program name matching a particular pattern. For example, you could define a class ACCTNG for all jobs executing from a specific account, say ACCTNG. Then, any ACCTNG job would automatically receive CPU resources at least equal to the definition of the class.

This portion of OVERLORD is referred to as PERCENTAGES. With the PERCENTAGES module, you can also dynamically grant more or less CPU to any individual or group of jobs, sessions or processes.

OVERLORD uses Wingspan, the character-based windowing product from Software Research Northwest, to control the screen display. The OVERLORD screen is a series of configurable (size and placement), overlapping windows:

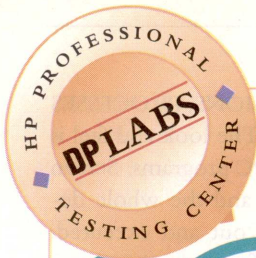
CLASSES, JOBS, SESSIONS, PROCESSES and RAMXL FILES. The look and feel is very reminiscent of PC programs. Screen I/O is very efficient and the whole design is well thought out and executed. OVERLORD also offers extensive, easy-to-use, context sensitive on-line HELP. This makes up for the product's somewhat confusing manual.

OVERLORD requires a continuously running background job called WATCHER, which collects statistics and implements the OVERLORD classes. Every five to 10 seconds, WATCHER adjusts the priority of processes under OVERLORD control to achieve the targeted CPU utilization goals.

In a production environment, I would probably set up a terminal dedicated to running OVERLORD. I would then configure the program to automatically switch windows every 30 seconds or so giving me constant feedback on the use of CPU resources. This would allow me to react quickly to a changing mix.

In addition to the PERCENTAGES module, OVERLORD interfaces with RAMXL (which can be run as a separate program if desired) and displays the current status of RAMDISC memory in one of its windows. RAMXL is a software tool for managing I/O. It's particularly beneficial for systems with a heavy physical I/O rate coupled with at least some idle CPU capacity. RAMXL allows you to force frequently accessed files to stay in memory (that portion of memory with RAMXL loaded files is called the RAMDISC). This will cut down on physical I/Os, which will cut down on CPU wait and should improve throughput. As with PERCENTAGES, RAMXL is extremely easy to use.

OVERLORD is not intended as a replacement for full-featured performance products like GlancePlus from Hewlett-Packard or similar third-party software. It does, however, add significant value to Kelly's add-in memory modules by providing several powerful tools for the system manager's toolbox. In fact, thanks to OVERLORD and RAMDISC, there's a lot you can say for Kelly memory in addition to "it works."



SECURITY TOOLKIT/UNIX V2.1

OBSERVATIONS:

- Fully menu-driven
- Reports on dozens of potential UNIX security problem areas
- Low learning curve
- Supports stand-alone or networked UNIX systems
- Report merge ability

PRICE:

Ranges between \$250 and \$9,790 based on platform

PLATFORM:

SunOS (SPARC), SunOS (Sun 3), HP-UX (PA-RISC), AIX (RS/6000), ULTRIX (RISC) and ULTRIX (VAX)

Raxco Inc.

2440 Research Blvd.
Suite 200
Rockville, MD 20850
tel: (301) 258-2620
fax: (301) 670-3585

CIRCLE 304 ON READER CARD

The UNIX Networkshop

Raxco's Security Toolkit/UNIX V2.1 Tightens Network Integrity Without Nailing Down Your System's Power

Among the folk heroes of do-it-yourself Americans is the Yankee carpenter, Norm Abrams. Many a rainy afternoon we tune in to admire Norm's innate skills, years of practice and impressively extensive set of tools. We watch patiently as he constructs something both functional and aesthetical from simple materials.

Unfortunately, we don't always experience the same logical unfurling of events when building a computer network. For example, UNIX security is often difficult to hammer out during network construction. While data processing professionals express their awe of the system's power and flexibility; administrators, particularly those charged with the management of sensitive, highly confidential data, are wary of UNIX's ability to guarantee the security of such data. And to some extent, these concerns are justified.

Security Toolkit/UNIX V 2.1 from Raxco (Rockville, MD) hits the UNIX security nail squarely on the head. Security Toolkit is comprised of several modules, including System, User and Network, which together assess and report on an imposing list of potential security problems peculiar to UNIX. Security Toolkit accomplishes this by the automatic collection, from stand-alone or networked UNIX systems, of data regarding the condition of those systems.

In the System module, five areas are monitored: file attributes, cron/batch utilities, startup file integrity, device integrity and mail utilities.

Michele Petrovsky

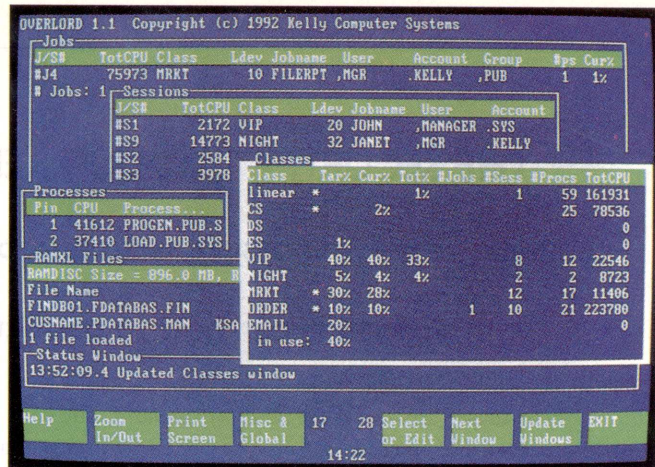
How KELLY's Overlord™ controls HP 3000 performance problems in three easy steps.

Get Overlord from KELLY Computer Systems and leverage the extra productivity you need from your HP 3000 at a fraction of the cost of a total system upgrade. Overlord is a unique three-part product that tackles all the most prevalent obstacles to peak performance.

1 Percentages™ lets you control the percent of CPU resources available to each job, session or process. At the touch of a button, restrict "killer jobs" from bogging down the CPU, and make sure your top priorities get all the power they need. Overall productivity improves dramatically when you put first things first.

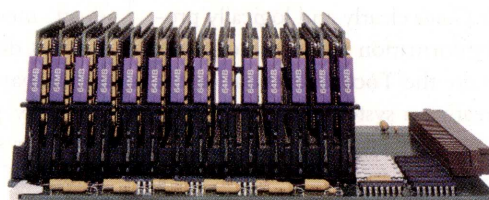
2 Ramdisc™ ends disk I/O bottlenecks by creating a solid-state "electronic disk" for heavily accessed files on the main memory bus. At the device level, memory access is about 30,000 times as fast as disk access; at the system level, performance gains of 30-70% are typical.

3 You can never have too much **KELLY memory**; in fact, the performance of your entire system is tied directly to main memory size. We design all our boards in-house using an advanced CAD system that guarantees unconditional enforcement of our conservative design rules. We build our boards in the USA using only HP-preferred parts, and then subject each finished board to a 100-hour intelligent burn-in on the HP system it's designed for. The end result of our meticulous attention to quality is a mean time between failures of over sixty years.



Fine-tuning is easy with Overlord's menu-driven user interface.

In ten years of exclusive focus on HP performance enhancement, KELLY has never had an unresolved support issue. Our Worldwide Customer Response Center is fully equipped with current hardware and software, and is staffed around the clock by HP-trained Customer and Systems Engineers. In addition to Overlord for the HP 3000, KELLY makes a complete line of memory and Ramdisc products for the HP 9000 Series 800 servers and Series 700, 400 and 300 workstations. For electronic forms users on LaserJet printers, our unique FormMaster cartridge slashes forms printing time by an average of 90%.



Only KELLY takes your 9x7 memory up to one gigabyte.

Call KELLY today and put Overlord to work for you. We have sales and support offices throughout North America and Europe.

For the KELLY location nearest you, contact our headquarters listed below:

KELLY Overlord Memory and Ramdisc Configurations

HP SPU	KELLY Array Size(s) (MB)	Maximum Memory w/KELLY (MB)	Maximum Ramdisc (MB)	Notes
99x	256	2048	1792	Call for availability.
9x7	128, 64, 32	1024	896	To exceed HP memory limit, models except 987 and 977 use KELLY 7-array extender card plus one array on backplane. 987 and 977 use KELLY 8-array extender card. All feature KELLY custom single-chip memory controller using 0.8-micron technology.
980	64, 16	1024	896	Online/offline switch; online and activity LED indicators.
95x, 960	16	256	192	Online/offline switch; online and activity LED indicators. KELLY maximum exceeds HP limit.
958, 948, 932, 922, 920	32	384	320	KELLY custom single-chip memory controller uses 2.0-micron technology. KELLY maximum exceeds HP limit.
949, 935, 925	32, 16	224	160	

KELLY

COMPUTER SYSTEMS

**North American
Headquarters**

139 N. Whisman Rd.
Mountain View, CA 94043
USA
TEL: 415 - 960 - 1010
FAX: 415 - 960 - 3474

**European
Headquarters**

Am Felde 2
2000 Hamburg 50
Germany
TEL: +49 40 391704
FAX: +49 40 391703

THE SECURITY TOOLKIT REPORT

contains scores of possible security problem areas

with suggestions on how to correct them.

Among these major areas, a total of 27 options are available, including I-node change times, link counts, permissions, cron file contents and command aliases.

The User module looks at such characteristics as disabled accounts, inactive accounts, duplicate group and user IDs, login failures, the umask (default permissions) of user-created files, and suspicious file names (any files in user directories that duplicate a common system command or utility). The Network module observes such factors as trusted hosts and a variety of FTP access characteristics. All told, Raxco offers a comprehensive set of UNIX-watchers.

The Security Toolkit/UNIX *System Manager's Guide* clearly and logically provides the information you need to install, learn and use the Toolkit. Installation involves creating a system account for the Toolkit, and answering a few configuration questions.

What's Inside The Toolkit?

In our Lab work, we activated and examined each item of every menu that can be pulled down from the Toolkit's main menubar. The main menu includes the following sets of selections: Toolkit, Summary, System, User, Network and Help.

We started Security Toolkit with a character-cell interface, rather than a Motif or Open Look one, because we intended our initial tests to run via modem/VT220 emulation on a remote PC. We did this in order to demonstrate a flexible remote management capability. In those tests, we first chose the checks to be run by Security Toolkit on system files. We decided to run everything the Toolkit had to offer in the System area, and further, to run these jobs in back-

ground; but with the option of notification by means of a pop-up dialog, should Security Toolkit find anything amiss. The pop-up notification can be delivered by E-mail.

From the Run Jobs window we kicked off the execution of all Security Toolkit monitoring areas. All these jobs ran in background by virtue of our already having selected that mode (as opposed to interactive or batch execution) from the Execution Options dialog box.

Security Toolkit also makes it easy to define the nature of the reports it provides. When you set execution options, you define report formats at the same time. Those formats are simply named short, medium and long. The most significant difference between these formats is the way in which they sort the material they present to you. Each report, however short or long, contains all the results of the security check that produced it.

Having given Security Toolkit plenty to saw through, we decided immediately to check the status of these just-submitted jobs. The Toolkit was ahead of our game. Even as we clicked our way through the menu hierarchy to the View Jobs selection, Security Toolkit was already reporting to us, via pop-up notification as we requested.

We asked the Toolkit to report to us in its long format, meaning that it would include in those reports, the succinct responses found in short format, such as the name of the module being run, start time, and breakdown of problems identified by category such as security, informational, or failure. It would also offer extensive explanatory text regarding the details of each problem, as well as suggestions for correcting every glitch.

After running numerous jobs, we now

had quite a gaggle of bytes. We then took advantage of the Toolkit's ability to merge all or any combination of previous reports (we decided to go for the gusto and select all) generated by individual modules into a single printer file. We printed the file and then sat back to review the Toolkit's diagnoses and suggested treatments.

For instance, we asked for information on operating system files whose IDs and GIDs were not what you would have anticipated. It turned out that there were several such files on our 9000/834 whose IDs should have been assigned to **root**, but instead had been given to **bin**.

Another check we requested of the Toolkit was for files of a size larger than normal. Once again, Security Toolkit accurately located this information. We asked it to find files with access permissions that were outside the norm, and it did so. Most problematic among this last group were files whose write permission had been set to "world." Our hardcopy contained not only the identification of these and scores of other possible security problem areas, but specific suggestions for correcting them as well.

Even one of these problems represents a possible threat, perhaps unintentional, but nevertheless real, to a system's security. The presence of the problems the Toolkit found for us, demonstrates that even well managed and maintained systems such as ours, present potential back doors and Trojan horses.

Because UNIX was developed as an open system intended to be used in academic and research environments, and because of its breadth and complexity, there's no question that the system offers hackers and accidents alike ample opportunity for affecting its integrity.

Through a comprehensive set of checks, alerts and reports Security Toolkit delivers protection from unwanted access, while promoting the power for which the UNIX box is known. In fact, Security Toolkit's collection of tools might be the software toolbelt Norm would wear himself if he were crafting a network. ■

19th Annual HP User Conference and Expo

HEWLETT-PACKARD
COMPUTER
USERS

Interex '93

San Francisco, Moscone Center ■ September 19-23, 1993

The Hands-on Conference for all Hewlett-Packard Computer Users

It's all here — The only major conference addressing all HP operating systems. Whether you are interested in MPE, HP-UX workstations or servers, RTE, PC Integration, or any combination of these, you'll find the conference delivers a wealth of information. There are more than 250 concurrent sessions covering all platforms.

You created the agenda. Conference program committee members actively sought the advice of you and your fellow HP users to develop the key themes for Interex '93.

- Database Technology
- Network Integration & Client-Server
- Interoperability
- Right-Sizing
- Strategic Planning
- Open Systems

Expanded HP-UX and Workstation Track. Industry experts will report on emerging trends on: standards, networking, commercial workstations and migrating to an HP-UX environment. Interex '93 will feature more than 100 HP-UX and workstation paper presentations and tutorials.

Be heard by top HP management. No other forum provides so many opportunities to communicate with top HP representatives including the dynamic strategic management forum and interactive strategy sessions.

CIRCLE 150 ON READER CARD

CONFERENCE KEYNOTE SPEAKERS INCLUDE:

Lewis E. Platt: *President and CEO of Hewlett-Packard Co.*
Conference Keynote

Making Strategic Information Planning Work
Dr. James C. Wetherbe, Director of Management Information Systems Research Center, University of Minnesota

Open Systems and Client-Server
Jeffrey Tash, President, Database Decisions

Rightsizing: The Key Technology and Business Choices We Face
John Logan, Executive Vice President and Co-founder, Aberdeen Group

Our Largest Expo Ever!
Interex '93 is the largest and best third-party Hewlett-Packard Vendor exposition in the country—featuring more than 160 exhibitors.

Who Should Attend:

- All HP Computer Users
- Programmers
- Software Engineers
- Senior Analysts
- System Administrators
- MIS Professionals
- Technical Users

PHONE, FAX OR MAIL FOR MORE INFORMATION ON INTEREX '93 SIMPLY CALL 800-INTEREX, OR MAIL THIS COUPON TO:

Interex '93 Conference, P.O. Box 3439, Sunnyvale, CA 94088-3439, USA

- ☐ I want to register now! Please fax me a registration form immediately

Send me:

- ☐ The full conference program detailing all papers and tutorials
☐ A free exhibit pass—Plus admission to conference keynote sessions

Name _____ Title _____

Company _____

Address _____

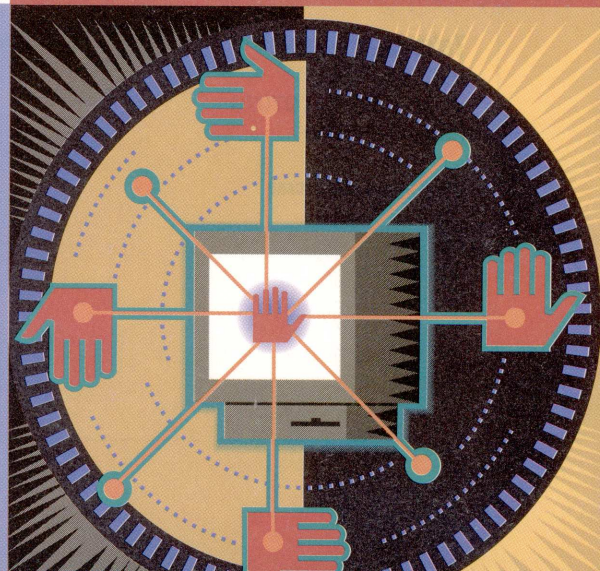
City _____ State _____ Zip _____

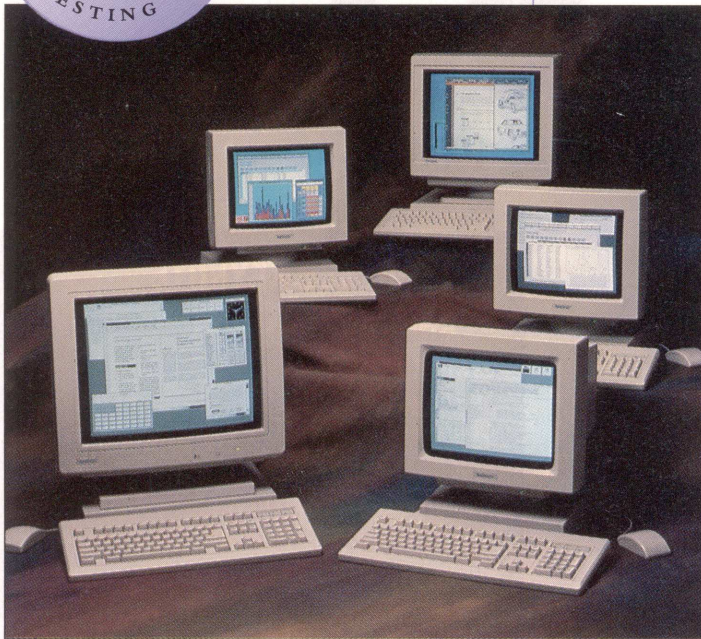
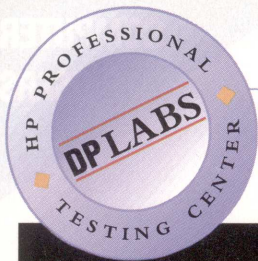
Phone _____ Fax _____ E-Mail _____

or Fax a copy of the coupon to (408) 747-0947

Watch for conference updates posted on comp.sys.hp NEWSGROUP

SFADPR





The Terminal That Would Be King

TEKTRONIX XP12

FEATURES:

- 19-inch monochrome X terminal
- 1280 by 1024 resolution
- 4MB RAM, expandable to 12 MB
- Plug and play setup
- Small footprint
- Worldwide sales, service and support

PLATFORM:

UNIX Compatible

PRICE:

\$2,495

Tektronix

P.O. Box 1000
Wilsonville, OR 97070
(800) 547-8949

CIRCLE 369 ON READER CARD

Tektronix's XP12 X Terminal Goes Above And Beyond The Common Terminal

In days of old, ASCII terminals were king of the hill. Some ASCII terminals could even provide multiple session capabilities by using multiple cables. Then the X terminal, riding upon its multisession, GUI steed, dethroned the king. But what differentiates one X terminal among the rest of royalty?

Today, almost any X terminal can provide its people with GUI and multitasking. But combine this with simple operation and outstanding service, and you begin to separate the peasants from true nobility. The Tektronix (Wilsonville, OR) line of X terminals demonstrates it could be the once and future king of terminals.

The Tektronix XP12 X Terminal DP Labs reviewed consists of a 19-inch monochrome monitor and logic unit supplied by Network Technologies (Chalfont, PA). The XP12 is in the low end of a product line that runs from the XP11, a 15-inch monochrome X-terminal with a resolution of 1024 by 768 for \$995, to the XP18, a 17-inch 256 color X-terminal with a resolution of 1152 by 900 for \$3,795.

Controls for the XP12 are simple and well placed at the front of the monitor. On the rear, a myriad connections for AUI, BNC, 10Base-T and serial data connections, as well as keyboard, mouse and a power outlet for the monitor, mean fewer wires coming from behind the unit. The logic unit fits so neatly underneath the monitor, that I initially mistook it for part of the swivel base.

Tim Porreca

Even with a well constructed keyboard and mouse attached, the entire setup uses less desk space than many smaller terminals. The XP12 sits 20.54 inches high, 18.19 inches wide and 15.4 inches deep. At 50.25 pounds, it is five to 10 pounds lighter than most 17-inch monitors. The XP12 is classified as a Class A digital device, which is typical for this type of terminal.

Any of our HP-UX compatible hosts would support the XP12, including our HP 9000 Model 710. The terminal's software, which installs on the host system, consists of the Quick Install and Utility programs. For a minimum installation, you only need the Quick Install tape. This tape installs the boot and configuration files necessary to boot the XP12. The installation takes only a few minutes and requires 20 MB of free disk space. If a previous version of the software exists, then the installation process will preserve it in another directory, a characteristic usually only found on good PC packages.

The loading of the Utility tape is optional but recommended. This tape contains font files, utilities, source files and the X Window Display Manager (XDM) executables and configuration files. The tape does not take long to install, but it too will require about 21 MB of disk space.

Finally, the installation manual will take you through configuring the host for the X terminal. These steps include enabling the Network File System and Trivial File Transfer Program, which provide the method of booting of the system, as well as exporting the boot and install directories, and setting up XDM.

Crowning Features

Once the software is installed, it's time to turn on the XP12. Initially, the network addresses and terminal configuration will have to be set for your network. During the initial booting process, the XP12 displays its boot monitor prompt into which the appropriate addresses and boot commands are entered using simple command line parameters. Once set, the configuration parameters are saved in

non-volatile memory. Future booting does not require user intervention.

The XP12 broadcasts XDM requests to all hosts on its subnet. The XP12's host menu then displays all hosts that have responded to its broadcasts including the boot host. This information is compiled in the terminal's host menu which provides a point-and-click menu to login to any host on your network.

For other log in functions, you choose the sessions menu located in the

**With a dot pitch of .28,
even long hours
in front of the XP12 are
easy on the eyes.**

setup window. The setup window is brought up at any time by pressing the setup key on the keyboard. From the sessions menu, you login to other hosts via Cterm, LAT, Telnet or a serial port.

The XP12's built-in host and setup menu make this X terminal easy to configure and use. Press the setup key and you're presented with a comprehensive window of configuration options, all of which can be saved in the system's non-volatile memory. The setups are comprehensive and offer keyboard and language options for worldwide operation.

The XP12 is available with a variety of keyboards including DEC, IBM and other UNIX systems. The XP12's user manual spends considerable time describing the different keyboard options as well as compose and diacritical sequences. Although, adequate for an end user, the manual is a generic one for Tektronix's entire line of X terminals and does not contain much detail about specific models like the XP12.

The setup window is easy to use and somewhat self-explanatory, but many of its configuration options are not mentioned in the manual. The undocu-

mented options tend to be more advanced such as those for network statistics and tables. These options would be better placed under an administrator's menu. The system administrator will want to obtain a complete technical manual for supporting the terminals.

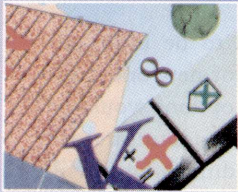
The administrator also will want to take advantage of the Tektronix hotline support that is included in its standard warranty. Tektronix is known for its support and DP Labs found its support personnel courteous and knowledgeable.

Tektronix's standard warranty provides 90 days of free hotline support for technical assistance and trouble-shooting. Beyond the standard warranty, which includes all labor, parts and return shipping with two day turnaround, users can opt for on-site service and a warranty extension. Costs range from \$175 to \$350 for one year of on-site service and hotline access.

As one of the few X-terminal manufacturers who service their own products, Tektronix has the service and support area covered. Calls from DP Labs were answered quickly and thoroughly. This also applies to its value added resellers as well, for the people at Network Technologies equally were gracious and experienced. No complaints here.

DP Labs found the Tektronix XP12 to be simple to operate, while providing numerous configuration possibilities through the built-in setup. Although the display controls were somewhat lacking with only brightness and contrast controls, both were well marked and easily accessible. With a refresh rate of 72Hz and a dot pitch of .28, even long hours in front of the XP12 are easy on the eyes.

The Tektronix line of X terminals should be on everyone's evaluation list when considering an X terminal. Service and after market support of this caliber often are difficult to find. Tektronix's competitive pricing, relatively simple installation and forgiving end user interface make it a feather in any DP manager's crown. ■



OBJECTIVELY SPEAKING

Richard Riehle

software project. If you're writing a small program by yourself, and that program will never need maintenance, and the level of complexity is small, forget engineering. Just write the program and go on to the next project. On the other hand, if your software application consists of many programs, requires a team of more than three people, must survive for more than two years, and should be endowed with the virtue of reliability, you might want to consider the software engineering approach.

Software engineering can be thought of as a hierarchy of notions. At the top of the hierarchy are goals. Often stated goals include, reliability, maintainability, understandability and efficiency. Some practitioners add other goals such as measurability or portability. At the next level in the hierarchy are principles. The more prominent principles are, abstraction, information hiding, localization, modularity, completeness and confirmability.

Principles support the next level, methods. Three general methods are data-flow-oriented design, data-structure-oriented design and object-oriented design. At the next level down are development tools and programming environments. Unfortunately, this is where most software people begin and end their education in software construction. Very few software people think about methods. Fewer still ever consider the possibility of goals and principles.

We learn tools, such as programming languages, editors and debuggers, and that's enough. Once we master a particular development environment (read programming language), we rarely move

Use It Or Lose It

Software engineering may not be appropriate for every

beyond it. Our first language is our favorite language. And we can justify the use of that language for every programming problem in the world.

One of my Japanese clients risked telling a joke at dinner one evening. He asked, "What do you call someone who speaks three languages?" The answer was trilingual. Then he asked, "What do you call someone who speaks two languages?" The answer to that was, bilingual. Finally, he asked, "What do you call someone who only speaks one language?" The answer, an American.

So what should we call a programmer who can only code in one language?

American Ingenuity

We are entering an era when knowing one development environment and some associated techniques isn't going to be enough. Many of our older systems have been subjected to so much maintenance that they are literally beyond repair. They need to be re-engineered. Large U.S. industries are now re-engineering their domain critical software. And as it turns out, selection of a programming language is the least important part of this re-engineering process. Moreover, production of source code is only a tiny part of the re-engineering cost. The real costs are in requirements definition, requirements analysis, functional specification development, software product design, and quality assurance.

Guess where the coding is being done? India, Singapore, Taiwan, South and Central America, the former Soviet Union, and even the People's Republic of China. Just as U.S. hardware industries discovered how to conserve assets by sending part of the manufacturing process offshore, so too are software intensive products being coded by laborers within other political boundaries.

Right now, it is more difficult to send the actual software engineering process overseas. Software engineering requires a higher level of native language communication skills. It demands continual interaction between the developer and the client. However, with the advent of CASE tools, even software engineering processes could be vulnerable. Many CASE tool vendors enjoy as much or more success in Europe and Asia as they do here.

Japan, in particular, seems to have a strong appreciation for incorporating the engineering paradigm into software construction. Their engineers are predisposed to teamwork, have a dedication to their work that includes a commitment to quality, and excellent engineering education. In addition, they seem more favorably disposed to the use of formal methods than U.S. software developers. Many U.S. programmers are still more concerned with their individual freedom and creativity than they are to the success of a large, complex software project.

As our projects become larger, and more complex, and as we move into the next decade of re-engineering our rotting software products developed over the last two or three decades, we must begin to employ the new disciplines in software engineering that are emerging today.

This is probably the most important issue in software management facing today's and tomorrow's software development executive. Ignore it, and our software industry will travel the same road as our automobile and consumer electronics industry.

Would you like to continue to see articles on this topic?
Circle on reader card
yes 342 no 341

Fax For Facts

Valuable Information Free of Charge

FOR FAST SERVICE

Do you need product information fast? Now you can FAX your information requests directly to *HP Professional* for quicker response.

Follow these 7 easy steps:

- **1.** In each box print the numbers corresponding to the products featured in this issue's advertisements or editorial mentions.

- **2.** Attach your mailing label below or print your name, address, telephone number and Fax number.

Name _____	Subscriber # _____
Title _____	Dept./MS _____
Company _____	
Address _____	
City _____	
State _____	Zip _____

Telephone () _____ Fax () _____

Please answer these questions:

- | | |
|---|--|
| <p>► 3. My company plans to purchase requested products:</p> <p><input type="checkbox"/> Within 3 months</p> <p><input type="checkbox"/> Within 6 months</p> <p><input type="checkbox"/> Within 12 months</p> <p>► 4. Is the budget (check one):</p> <p><input type="checkbox"/> In preparation</p> <p><input type="checkbox"/> Pending approval</p> <p><input type="checkbox"/> Approved</p> | <p>► 5. <input type="checkbox"/> I would like to receive a free subscription to <i>HP Professional</i>. Please send information.</p> <p>► 6. <input type="checkbox"/> Check if change of address</p> |
|---|--|

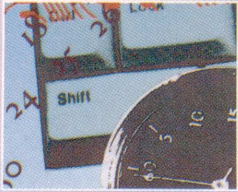
- **7.** Detach and FAX this form to *HP Professional*. Manufacturers will then mail product literature to you free of charge.

In the US FAX to: **(215) 957-4264** Outside the US: **010 1 (215) 957-4264**

Thank you. Your request will be processed immediately.

HP Professional

101 Witmer Road ► Horsham, PA 19044 ► 215.957.1500 ► FAX 215.957.4264



PC TIPS

Miles B. Kehoe

problems with MS-DOS V6.0, and I have to admit that some of the problems have been major. For example, there's no way I'll use the DoubleSpace disk compression until the bugs are worked out on someone else's data. On the other hand, there are some features in MS-DOS V6.0 that I've been wanting for years, which no one has really discussed. Here's why I decided to update to MS-DOS V6.0 on my systems, and what I've found so far.

Custom Configurations

By far, the feature I use the most is the ability to store and use different configurations. I have a handful of systems I use all the time, but I have several different applications that seem to require incompatible versions of CONFIG.SYS. For example, I usually want to connect to my local Novell server, because that's where I keep the majority of my shared files and programs.

However, because I try to do so much with my primary system, I can't use my Soundblaster card while the network is loaded because I'm out of interrupts. Before MS-DOS V6.0, I stored several different copies of CONFIG.SYS and AUTOEXEC.BAT, and whenever I needed to change configurations, I ran a batch file that copied the appropriate files into the root directory before I manually rebooted. Sound familiar?

CONFIG.SYS Blocks

With MS-DOS V6.0, I can define more than a single logical configuration in CONFIG.SYS and then, at boot-up, select which logical configuration to use. The method Microsoft uses to imple-

In the past six months, a great deal of press has focused on the

With MS-DOS V6.0, I can define more than a single logical configuration in CONFIG.SYS.

ment these logical configurations will look familiar to you if you've ever explored any of the Windows configuration files such as WIN.INI or SYSTEM.INI. A typical CONFIG.SYS file, such as the one shown in Figure 1, contains any number of "blocks," each of which starts with a line enclosed in square brackets naming the section.

This file defines two sets of configurations, one for use under Windows with the network drivers loaded, and a second for local non-Windows applications only. When you boot your system, MS-DOS displays a menu that contains the two

defined MenuItems. When you choose an option, MS-DOS creates a logical configuration from the Common block and the block named in the MenuItem line for the choice you make.

Here's a few details about the Menu block. The MenuItem line has two parameters: The first is the name associated with a block later in CONFIG.SYS, and the second is the text of the message that MS-DOS displays during boot-up. You can effectively specify any number of menu items, although a realistic number is probably no more than three or four.

When you choose between the options, MS-DOS loads the Common block and then loads the section named as the first parameter of the MenuItem line. For example, if you were to choose "Boot with Windows and Network Drivers," MS-DOS would include the Common block and the NetWin block, and exclude all of the statements in the NonWin block. In addition, MS-DOS defines an environment called CONFIG

FIGURE 1

```
REM Comments are allowed in REM Statements
REM Define Shared elements

[Menu]
MenuItem NetWin, Boot with Windows and Network Drivers
MenuItem NonWin, Boot standard MS-DOS

[Common]
device=c:\dos\setver.exe
device=c:\dos\himem.sys
...

[NetWin]
buffers=10
files=60
...

[NonWin]
files=40
devicehigh=c:\sys\ansi.sys
...
```

Typical CONFIG.SYS Blocks.

FIGURE 2

```
REM Set standard parameters
PROMPT %CONFIG%: $P$G
PATH=C:\DOS;C:\BIN;
REM - test to see which block loaded
GOTO %CONFIG%

:NetWin
echo Configured for Windows and network access
path=%PATH%;c:\net;c:\win;
...
GO TO End

:NonWin
REM Local only
echo Configured for non-Windows local access
only.

:End
```

AUTOEXEC.BAT Sample Segments.

and assigns it the value of the block name. Thus, in AUTOEXEC.BAT, you can test to see which block is active and hence which environment variables to set. *Figure 2* shows what AUTOEXEC.BAT might look like for the earlier CONFIG.SYS file.

Did you notice that I used the name of the configuration block in my PROMPT statement? Can you begin to see how useful this can be? And to make it even more useful, the Menu block supports several other commands. I'll provide a brief summary of these com-

mands, but refer to the MS-DOS documentation for complete details.

MenuDefault lets you specify the default MenuItem by providing the name of the default block. You also can specify a time-out period, after which the default MenuItem will load.

MenuColor allows you to specify the foreground and background colors of the boot-up menu text. You provide the foreground text color as an integer from 0 to 15, and an optional background color, also as a 0 to 15 integer. The basic color values are 0=Black, 1=Blue, 2=Green, 3=Cyan, 4=Red, 5=Magenta, 6=Brown and 7=White.

Add 8 to each of these values to make each of the colors brighter. A value of 9, for example, is bright blue; 15 is bright white. A value of 8, a bit of an oddball, is gray — not bright black.

NumLock, the final Menu block parameter, lets you specify whether the NumLock key should be on or off at start-up.

New Statements in CONFIG.SYS

Finally, in MS-DOS V6.0, there are additional statements you can use in CONFIG.SYS. For example, you can use an "include" statement to include any named block rather than repeat it. You can also set environment parameters in CONFIG.SYS, not only in AUTOEXEC.BAT. These statements seem to anticipate some future time when COMMAND.COM is not the shell for MS-DOS — perhaps one of the next steps in the evolution of MS-DOS.

Figure 3 shows what a CONFIG.SYS file might look like using all of these options. For details, use the MS-DOS HELP utility with the keyword for which you want help.

Note that, unlike with AUTOEXEC.BAT variables, you cannot use the current value of a CONFIG.SYS variable by using percent symbols around the name. That's why I had to include a fully qualified PATH in each section of *Figure 3*.

FIGURE 3

```
[Menu]

[MenuColor]=15,1
[NumLock=Off]
[MenuItem]=NetWin, Boot Netware and Windows
[SubMenu]=[Menu1]

[Menu1]
[MenuItem]=StdWin, Windows without Network Drivers
[MenuItem]=StdDos, Standard MS-DOS without Windows

[Common]
Set PATH=C:\DOS;C:\BIN;C:\BAT;
...

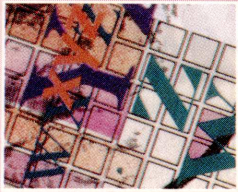
[Standard]
set HOME=C:\MyDir
...
[NetWin]
Set PATH=C:\DOS;C:\BIN;C:\BAT;C:\WINDOWS;C:\NET;
...

[StdWin]
Set PATH=C:\DOS;C:\BIN;C:\BAT;C:\WINDOWS;
Include=Standard
device=
...

[StdDos]
Set PATH=C:\DOC;C:\BIN;C:\BAT;
Include=Standard
...
```

Typical Menu Block.

Would you like to continue to see articles on this topic?
Circle on reader card
yes 338 no 337



NETWORKING

Tim Cahoon

Environmental Awareness

Hundreds of thousands of TCP/IP-based networks

spring up every year worldwide. This tremendous growth quickly claims available network addresses, and while people are aware of the problem, no one has come up with a complete, satisfactory solution. So in the spirit of the green movement that strives to save our planet, let us become green networkers and help preserve our network addresses.

Let reduce, reuse and recycle be our guideposts when working toward a better network environment. To make the best use of your TCP/IP network addresses, you should consider subnetting — the process of taking a network address that supports one network with a fixed number of hosts, and creating addresses for multiple networks with a smaller number of hosts. Subnetting has existed for some time, however, occasionally you'll come across system components that just won't support it. Check with your vendors before you get in too deep.

Good candidates for subnetting are small LANs with 60 workstations or fewer. Many complaints regarding network address abuse involve the use of addresses to support small LANs. Because the smallest TCP/IP address allows for 254 hosts, using it to support a 20-host network seems a waste.

Subnetting an address is a fairly simple process. A TCP/IP address consists of four numbers separated by "dots." Each number set is known as an octet, because its value, which ranges from 0-255, can be held using only eight bits. Addresses are formed in three classes, class A, class B and class C. An address class is determined by the first two bits of the first octet. As a guide, if the first octet is 0

to 127, it's a class A; if it's 128 to 191, it's a class B; and if it's 192 to 223, it's a class C address. Values 224 through 255 belong to the class D and E addresses, which are reserved for special functions. No need to memorize this; just know that they exist.

A subnet mask is a means of telling the system what bits are used for the network portion of the address and what bits are used in the host portion. In the mask, if the value of a bit is 1, then it is used to identify the network. If the value of a bit is 0, then it is used to identify a host. The default subnet mask for

Using subnetting, we can change this to make the first three octets the network, and the last octet the host. This subnet mask changes a class B address into multiple class C addresses:

```
134.238.10.5 subnet mask: 255.255.255.0
```

Here, with a different subnet mask, the network portion is 134.238.10, and the host identifier is 5.

The task at hand changes when you deal with the most common type of TCP/IP address, the class C. In a class C address, the first three sets of numbers

```
192.52.172.33 to 192.52.172.62 (hosts 32 & 63 reserved)
.00100001 .00111110

192.52.172.65 to 192.52.172.94 (hosts 64 & 95 reserved)
.01000001 .01011110

192.52.172.95 to 192.52.172.126 (hosts 96 & 127 reserved)
.01100001 .01111110

192.52.172.129 to 192.52.172.158 (hosts 128 & 159 reserved)
.10000001 .10011110

192.52.172.161 to 192.52.172.190 (hosts 160 & 191 reserved)
.10100001 .10111110

192.52.172.193 to 192.52.172.222 (hosts 192 & 222 reserved)
.11000001 .11011110
```

Figure 1

a class B address is 255.255.0.0, which is 11111111.11111111.00000000.00000000 in binary. The default subnet mask for a class C address is 255.255.255.0 — 11111111.11111111.11111111.00000000 in binary.

Here's a simple example for the class B TCP/IP address:

```
134.238.10.5 subnet mask: 255.255.0.0
(default mask)
```

In a class B address, the first two octets define the network, and the last two octets identify the host.

refer to the network portion and the last set refers to the host.

To subnet a class C address, you actually use some of the eight bits in the last octet. Keep it simple so you don't confuse yourself and others. It's also best to use the left-most bits for the network and the right ones for hosts. This keeps the format similar to the standard scheme. When we subnet, we must keep in mind one rule regarding TCP/IP addresses: Addresses whose last octets (or bits, if you

are subnetting a class C address) end in all 0s or all 1s are reserved. If we were using three of eight bits in a class C address to create a subnet, subnets 000 and 111 would be reserved and unusable.

To determine the number of usable networks in a subnet, use the following equation:

$$2^{(\text{number of network bits})} - 2 = \text{number of usable subnets}$$

To determine the number of usable hosts per subnetwork, use this equation:

$$2^{(\text{number of host bits})} - 2 = \text{number of usable host addresses}$$

For example, in a class C network you want to use three bits for the network and leave five for hosts:

$$2^3 - 2 = 6 \text{ usable networks}$$

Here we have taken two and raised it to the third power, because we are using three bits for the network. We then subtract two from the total because of the unusable all 0 and all 1 subnets.

192.52.172.0 to 192.52.172.31 (host portion all 0s)
.00000000 .00011111

192.52.172.224 to 192.52.172.255 (host portion all 1s)
.11100000 .11111111

Figure 2

Below, we've used the same formula to figure out the number of hosts we can have with only a certain number of bits:

$$2^5 - 2 = 30 \text{ usable host addresses per subnet}$$

The two that we subtract are for the all 0 and all 1 hosts that are reserved.

To figure out a subnet mask, express the host portion in binary with the bits to be used as the network address set to 1. If you want to subnet a class C address and use three bits for the subnet, you write the octet in binary as 11100000. Convert it to decimal, and you get the value of 224. Therefore, your subnet mask for this class C address is 255.255.255.224.

Figure 1 shows the networks you

would get in subnetting a class C address using three bits for the network. The binary number under the host octet illustrates how the subnet bits work.

The unusable networks because of all 0s and 1s rule is shown in Figure 2.

A few final notes regarding subnetting. Only the hosts on the subnet need to understand it. Everything is handled by the hosts themselves or gateways into the network. Each host on the subnet must have a subnet mask specified. Novell servers use the MASK parameter on the BIND statement located in the AUTOEXEC.NCF file.

Would you like to continue to see articles on this topic?
Circle on reader card
yes 346 no 345

IF HP/APOLLO WORKSTATIONS ARE YOUR DOMAIN

OSC IS YOUR SOURCE

- A leader in HP/Apollo service
- On-site/depot maintenance
- Parts evaluation & repair
- Programs to fit your needs
- Quality service & pricing
- 72 hour turn around

One Source Computer Services, Inc.

249 Cedar Hill Rd.
Marlboro, MA
(508) 481-3600
FAX (508) 481-0991
Corporate Headquarters

CIRCLE 106 ON READER CARD

Take Control of Your System's Performance

with Robert Lund's Taming the HP 3000 Vol. II Book!

Let Robert Lund's book teach you how to whip your system into shape. Getting control of your hardware investment with his new book, will extend the life of your Classic or XL System.

Taming the HP 3000 Vol. II contains:

- Over 300 full-size pages, complete with graphs, charts, tables and figures.
- Methods of predicting future hardware requirements (capacity planning).
- Practical and easy approaches to dealing with performance crises.
- Ways to identify problem areas and how to "fix" them.

It will give new life & meaning to Managing your System's Performance! You will not believe the results. Hurry and call now for more information!

****SATISFACTION/MONEY BACK GUARANTEE!****

1-503-327-3800 or Fax 1-503-327-3276
34130 Parkwoods Dr. NE • Albany, OR USA 97321

LUND
PERFORMANCE SOLUTIONS



CIRCLE 250 ON READER CARD

HP To Offer OMNIDEX As Enhancement For MM

Hewlett-Packard announced plans to offer its MM, PO, PM and MNT customers a low-cost enhancement that adds OMNIDEX retrieval capability to these applications.

The enhancement, known as HP Easy Search for MM II, gives customers the ability to do instant look-ups and subset data retrievals via selection windows that can be invoked over an existing MM II screen.

The enhancement draws on two of Dynamic Information Systems Corp.'s (DISC) key products: OMNIDEX and its user interface, OmniWindows.

HP and DISC co-developed the enhancement that works on both MPE/iX and MPE V HP 3000 systems. With HP Easy Search, companies using MM will be able to quickly retrieve information from their manufacturing databases based on multiple selection criteria — vendor, transaction date, location, part description, etc. — without leaving the application itself. The selected information can be used for quick lookups, or used to update subsequent MM transactions.

Contact DISC, 5733 Central Ave., Boulder, CO 80301; (303) 444-4000.

Circle 400 on reader card

AIR For Windows Integrated With Intel's LANdesk

SPRY Inc. announced that its Windows TCP/IP package, AIR for Windows, will be integrated with Intel's LANdesk Manager. LANdesk Manager provides management tools that integrate inventory management, remote desktop management, virus protection, application and server monitoring and network traffic analysis. In order to provide TCP/IP to the package, SPRY's AIR for Windows was selected.

AIR for Windows includes a fully MS Windows-compatible VT220/102 terminal

emulator, file transfer protocol, telnet, line printer redirector and AIRMAIL, a Windows implementation of Internet Mail. NFS and TN 3270 are add-on options.

AIR for Windows supports either the Network Device Interface Specification or Open-Data Link Interface driver standard. Contact SPRY Inc., 1319 Dexter Ave. North, Ste. 150, Seattle, WA 98109; (206) 286-1412.

Circle 399 on reader card

Unlimited Storage For HP Systems

WorkStation Source announced the SEJUS Removable CartridgeDisc system for applications requiring extensive or unlimited storage volume. The system is also suited for applications that require maximum data security or maximum flexibility in data interchange and data transportability.

The mechanism can be mounted in one 5 1/4-inch half-high disk bay of an HP R/362, R/382 and Model 362/382 desktop controllers and uses HP-UX 7.0 or later OS release and HP-BASIC 6.01 or later OS release.

The removable cartridge disk also may be used as a high-speed back-up device or as part of a multiple drive configuration to improve overall system performance. Each cartridge has a formatted capacity of 44 MB or 88 MB depending on the model.

Contact WorkStation Source Ltd., 16 Auckland Close, Maidenhead, Berkshire SL6 8QB; 0628 75252.

Circle 398 on reader card

HICOMP, Texas ISA Announce Packaging Agreement

HICOMP America Inc. and Texas ISA Ltd. signed a VAR agreement that will result in the packaging of HICOMP's Backup and Archiving Software with ISA's optical drives and other storage devices.

The combination of the Optical Jukebox from ISA and HICOMP's HIBACK Software and a Serial DAT Stacker will allow users to

purchase a total automated network backup and archival solution from a single source.

By using HIBACK to back up multiplatform workstations over the network, the ISA Optical Jukebox will be able to quickly store daily incremental and weekly backups. The Optical Jukebox then will allow online restore of files by users as needed. Once information can be moved off line, it will automatically be moved to serial media, such as DAT, for archiving. This DAT device can be a stacker for online archive restore, or the serial media can be moved off site if required.

Contact HICOMP America Inc., 419 Canyon Ave., Ste. 215, Ft. Collins, CO 80521-2670; (303) 224-9700.

Circle 397 on reader card

XVT Adds HP Support For Portable GUIs

XVT Software Inc. announced support for several additional environments for its XVT Portability Toolkit and XVT-Design software. Updates to Release 3.0 of the Toolkit and Release 2.0 of XVT-Design add the HP Series 800 and the entire line of Data General AViiON workstations and servers to its list of supported platforms. X Window/Motif and character screen support is provided.

The updates allow an XVT developer to exploit the performance of the graphics capability of the Silicon Graphics IRIS 4D RISC-based systems. Support for SCO Open Desktop 2.0 also is now provided.

XVT products are licensed on a developer-seat basis, with no additional user licensing or royalties.

Contact XVT Software Inc., 4900 Pearl East Cir., Boulder, CO 80301; (303) 443-4223.

Circle 396 on reader card

Ernst & Young Releases Navigator Systems 2.0

Ernst & Young released Navigator Systems Series 2.0, an automated application

development environment that integrates the processes used to build applications.

Release 2.0 assists organizations with "Business Process Innovation SM," or the re-engineering of business processes through information technology. It supports client-server computing and object-oriented approaches.

Operating in both Windows and OS/2, Navigator Systems Series also provides true interactive, online desktop training and a groupware environment for systems development teams.

Contact Ernst & Young, 787 Seventh Ave., New York, NY 10019; (212) 773-6183.

Circle 395 on reader card

NCR Enhances TOP END

NCR Corp. announced several enhancements to TOP END, its distributed transaction processing system. The new features include Microsoft Windows Dynamic Link Library (DLL) Support, Enhancement International Language Support and IBM 3270 Terminal Support.

TOP END integrates high-performance OLTP, enterprise-wide online data access and complex decision support for both open and legacy systems. It works in conjunction with Informix and Sybase relational databases, as well as ORACLE and Teradata databases.

TOP END is available on the HP 9000 and the NCR System 3000. Pricing varies depending on customer application.

Contact NCR Corp., 1700 S. Patterson Blvd., Dayton, OH 45479; (513) 445-5000.

Circle 393 on reader card

ReFORM Eliminates Preprinted Forms

Pacific Genesys announced ReFORM, a product that eliminates the use of expensive preprinted business forms by enabling UNIX software applications to produce high-quality forms on laser printer plain paper.

ReFORM eliminates the waste associated with aligning expensive, multipart preprinted

forms in dot-matrix printers. It also can send the same information via FAX system, removing the cost of paper, envelopes, postage and labor.

It takes the standard output from any UNIX application, reformats it, merges it with a form template designed by the user (or supplied with the software) and distributes the merged forms to individual laser printers or FAX systems throughout a company. It can print multiple copies, and each part of a multipart form can be different.

ReFORM supports accounting and database software and is available on many UNIX platforms, including HP.

Contact UniDirect Corp., One Venture, Irvine, CA 92718; (800) 755-8649.

Circle 394 on reader card

OMTool 1.2 Supports HP Platforms

The GE Advanced Concepts Center announced OMTool 1.2, an interactive, workstation-based data modeling tool available in the HP 9000 700/800, Sun/3, Sun/4 and PC/386 platform configurations.

The updated tool supports graphical preparation and editing of object models for systems, programs and databases using the Object Modeling Technique (OMT) developed by General Electric Scientists.

Capabilities added to OMTool 1.2 include link attributes, aggregation trees, association names, color and line style formats, as well as supporting the HP and PC platforms.

Contact GE Advanced Concepts Center, 640 Freedom Business Center, P.O. Box 1561, King of Prussia, PA 19406; (800) 438-7426; (215) 992-6200.

Circle 391 on reader card

POSLogic System Integrates Hardware, Software

POSLogic Corp. announced the POSLogic 5000 Point of Sale System, a UNIX-based Point of Sale System to incorporate both



The Power of Efficiency

EDI WINDOWS:TM Enabling technology for business in the '90s

Successful businesses across North America know that Electronic Data Interchange (EDI) is bringing true automated efficiency to a host of everyday tasks formerly done by hand. *EDI WINDOWS* enables the link from your **HP3000, HP9000 and other open system platforms**, to those all-important customers and suppliers, for purchase orders, quotations, invoices and much more.

EDI WINDOWS supports X12, EDIFACT, TDCC Standards and many more. In the electronic marketplace, *EDI WINDOWS* can work for you.

**For powerful solutions,
call 1-800-ANSWERS**

M. B. Foster Associates Limited
50 Water Street
P.O. Box 580
Chesterville, Ontario
Canada K0C 1H0

Tel (613) 448-2333
Fax (613) 448-2588



Your Integration Software Supplier®

EDI WINDOWS is a trademark of trinary systems inc.

CIRCLE 155 ON READER CARD



**HARBORSIDE
COMPUTER
MARKETING**

813-799-2009

We
Buy/Sell/Lease All
HEWLETT PACKARD!

AND

We service
1000/3000/9000
Memory/Workstations/
Printers/Plotters

Harborside Marketing, Inc.
1010-A Park Court
Safety Harbor, FL 34695
813-799-2009
FAX 813-791-6699

CIRCLE 215 ON READER CARD

THE BEST IN THE BUSINESS!

"Software Specific" Hewlett-Packard Keycaps

Top Quality

Fast Service

**Guaranteed
Satisfaction**



Call
800 444-KEYS



Syntronics

980 Buenos Ave., Suite C2
San Diego, CA 92110
800-444-5397 FAX 619-275-3520

CIRCLE 455 ON READER CARD

NEW PRODUCTS

hardware and software as a fully integrated product.

Every POSLogic terminal comes with full-featured Point of Sale and Inventory control software designed to operate under all popular varieties of UNIX. Cash sale, credit, refund, exchange, partial payment, store account and other sophisticated types of transactions are supported.

Each POSLogic terminal includes a standard built-in VGA display, receipt printer, magnetic card reader, 101-key keyboard, 38.4 Kbps host communications, interfaces for various options, the ability to support all popular bar coding schemes, as well as the Point of Sale Inventory Control software.

The POSLogic 5000 system starts at \$3,195.

Contact POSLogic, 2181 NW 99 Ave., Pembroke Pines, FL 33024; (305) 433-5310.

Circle 390 on reader card

VISTA 3.0 Features Compression Algorithm

Quest Software announced VISTA 3.0 for the HP 3000, which contains customer-requested enhancements and advanced report analysis.

VISTA 3.0 compresses reports when they are captured to reduce disk space requirements. The compression algorithm can save as much as 80 percent of the space a report consumed.

When searching for text within a report, multiple search strings can be entered and searches by columns and windows performed. A search-all function also is available to find all lines that match search criteria. Search by indexes provides immediate detection of matches when searching large reports.

Reports now can be divided into multiple windows for easy viewing and printing of many sections of a report on a single screen. Contact Quest Software Inc., 610 Newport Center Dr., Ste. 890, Newport Beach, CA 92660; (714) 720-1434.

Circle 392 on reader card

PRINTPATH Extends HP 3000 Spooling

RAC Consulting announced the PRINTPATH family of network printing options for ESPUL, The Extended Spool Utility for the HP 3000. ESPUL is a spoolfile management system for MPE. PRINTPATH is a set of add-on products that extend HP 3000 spooling to network printers.

PRINTPATH/DIRECT enables the HP 3000 to spool output to LaserJet printers that are directly connected to the TCP/IP LAN with HP's JetDirect interface card. PRINTPATH/NET enables the HP 3000 to spool output to network printers operating under popular network operating systems such as Novell and LAN Manager.

PRINTPATH/UX delivers bidirectional report transfer and printer sharing between HP 3000 and HP 9000 systems. PRINTPATH/NETWARE allows an HP 3000 running NETWARE/iX to spool output to Novell print queues.

Contact RAC Consulting, P.O. Box 10099, Olympia, WA 98502; (206) 357-9572.

Circle 389 on reader card

Hardcore Enhances Power Windows/3000

Hardcore Software enhanced the Power Windows/3000 product for the HP 3000.

Power Windows/3000 allows you to access up to 20 programs simultaneously from an HP dumb terminal or emulation software. You can jump from any prompt in any screen to any other screen you have running.

The ability to modify run parameters of any program that is loaded by Power Windows/3000 has been added. This allows the software to work with a variety of HP 3000 software products and custom code.

Contact Hardcore Software, 150 Hamakua Dr., Ste. 426, Kailua, HI 96734; (808) 237-7183.

Circle 388 on reader card

Teamwork/RqT 1.3 Provides Extended Capabilities

Cadre Technologies introduced the latest version of Teamwork/RqT, its software development automation product for requirements capture, management and tracking.

Teamwork/RqT 1.3 offers enhancements and new features that significantly extend its capabilities and improve usability and performance. Linked to Cadre's comprehensive Teamwork family of software development automation products, Teamwork/RqT 1.3 simplifies requirements management through automated tracking and reporting of requirements against project deliverables.

Teamwork/RqT 1.3's flexible allocations capabilities can link requirements to targets consisting of Teamwork model objects,

objects in other tools, document structures, test plans and code. Its impact analysis capabilities enable project managers to easily determine the full impact of proposed requirement changes on the entire project including schedule, budget and resources before the changes are made.

An added productivity feature is the new Quick Requirements option which allows users to map text to requirements.

The product is available on HP 9000 Series 700 and other UNIX workstations. Contact Cadre Technologies Inc., 222 Richmond St., Providence, RI 02903; (401) 351-5950.

Circle 387 on reader card

LAZER LINK III Extends SCSI Distance

Applied Concepts announced the LAZER LINK III, a SCSI Fiber Optic bus extender that fully supports 10 MB per second "fast SCSI" computers and peripheral devices.

The LAZER LINK III (Model ACI-2003) SCSI Fiber Optic Bus Extender lets you surpass the six-meter distance limitation of a single-ended SCSI bus. It enables the SCSI bus to be extended up to 3,000 feet (1 Km), plus supports a maximum data rate of 10 MB per second in synchronous and asynchronous mode. It is completely transparent to your SCSI system and supports any combination of asynchronous and synchronous SCSI devices on the bus. No additional software is needed for installation and operation. It does not require a SCSI device address.

The LAZER LINK III, MZModel ACI-2003, external unit costs \$1,695 complete with 110/220 VAC input.

Contact Applied Concepts Inc., 5350-H Eastgate Mall, San Diego, CA 92121; (619) 453-0090.

Circle 385 on reader card

RGB Spectrum Ships RGB/Videolink 1500

RGB Spectrum is shipping a new generation of video scan converters, the RGB/Videolink 1500 Series. These systems transform the output from any computer or imaging device to video format for video transmission, videotaping and video projection.

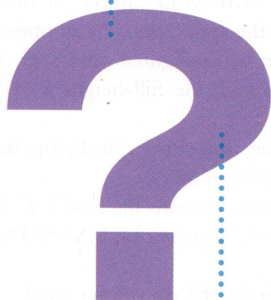
The new series offers antialiasing, 24-bit full-color processing, real-time operation and flicker elimination as standard equipment. Video outputs include NTSC (or PAL)

composite video, RGB (RS-170A or CCIR) and S-Video (Y/C).

The RGB/Videolink 1500AX converts the output from virtually any computer to video and automatically synchronizes to any

interlaced or non-interlaced, 15-90 kHz TGB source. The RGB/Videolink 1500A automatically synchronizes to any interlaced or non-interlaced 15-90 kHz RGB source. The Model 1500P is dedicated to a single

Is the Network Not Working



Is poor user productivity a problem in your business? Missed deadlines? Frustration in reaching your corporate goals?

In today's highly competitive environment, you don't need the hassle of dealing with complex network problems. If you want to get the network under control and get back into what you do best, you need to call on *experienced network specialists*.

Tryonics Technical Consulting Group

Because networks are our business, we are your best resource for network and software administration. Our professional consulting and support team is highly experienced in managing UNIX-based environments. We can help you increase productivity and control costs, no matter what the size or complexity of your network. And we can implement cutting edge technology when it's right for you. We have the total solution for your network operations.

▶ ▶ ▶ We'll make it work.

Long-term or project-based contracts available. Call 1-800-551-6236

 **tryonics inc.**

Workstation Computers and Services

Tryonics Inc. 170 West Road Portsmouth NH email: consult@tryonics.com Fax 603-427-6843

CIRCLE 300 ON READER CARD

workstation or imager. It is factory preset to work with any interlaced or non-interlaced 20-90 kHz RGB source.

Contact RGB Spectrum, 950 Marina Village Pkwy., Alameda, CA 94501; (510) 814-7000.

Circle 384 on reader card

Meridian Data Simplifies CD ROM Creation Process

Meridian Data announced Personal SCRIBE v1.1 recordable-CD software that eliminates the complex process normally associated with creating a CD ROM.

With Personal SCRIBE, the user picks the directories and files to be transferred and presses the return key, and the selected data is transferred to a compact recordable disk. Personal SCRIBE handles all file formatting so the user easily can generate an ISO9660 standard CD, readable in any CD ROM drive. This software can create single-session and multisession disks and provides an option to screen non-ISO9660 file and directory names.

The software supports a range of DAT 4mm tape drives, including HP for pre-mastering.

The Personal SCRIBE software requires a 386- or 486-based PC with a minimum rated speed of 20 MHz, 4 MB of memory and MS-DOS v5.0 or later. Personal SCRIBE is priced at \$2,995.

Contact Meridian Data Inc., 5615 Scotts Valley Dr., Scotts Valley, CA 95066; (408) 438-3100.

Circle 382 on reader card

Cincom Announces New Licensing/Pricing

As part of an overall Open Systems strategy, Cincom Systems Inc. announces new licensing/pricing options for CONTROL:Manufacturing (C:M), including a new usage-based license option. Cincom also has reduced its traditional platform-based pricing for CONTROL:Manufacturing by an average of 38 percent.

Cincom's new usage-level license option includes a base fee for each functional component, allowing a user to determine the scope of functionality (system modules) to be implemented and license only what is needed. It also includes a fee for usage, not directly related to the portfolio of modules or the platform but to the number of concurrent

system users. This approach ties the cost of the system directly to the actual usage of the system. This part of the license is available in blocks of 25 or 100 users.

Contact Cincom Systems Inc., 2300 Montana Ave., Cincinnati, OH 45211-3899; (513) 662-2300.

Circle 381 on reader card

Falcon Systems Releases 'Darth Vader'

Falcon Systems introduced the DV350 "Darth Vader" disk array subsystem, an eight-bay, 3 1/2-inch drive cabinet with fixtures for standard 19-inch rack mounting. For maximum data security, the DV350 features dual power supplies, ventilation fans, controllers and SCSI ports.

The DV350's eight drive bays can be populated with your choice of drives as needed by the application. As an option, the DV350 can be configured with four 3 1/2-inch drives and one full-height 5 1/4-inch drive.

The basic cabinet price, including fans and power supplies, is \$850.

Contact Falcon Systems Inc., 1417 W. North Market Blvd., Sacramento, CA 95834; (916) 928-9255.

Circle 383 on reader card

MEC Releases WiziWord 3.0

Microsystems Engineering Co. (MEC) announced WiziWord 3.0 for the IBM PC running Microsoft Windows.

WiziWord is a multiplatform WYSIWYG publishing product that combines document processing (WiziWord), object-oriented drawing (WiziDraw), plotting (WiziPlot), equation editing (WiziTeX) and both text and graphic filters. Because WiziWord has an identical file format across all supported platforms, it offers complete interoperability among supported platforms.

The newest enhancement is WiziTeX, a WYSIWYG equation editor based on TeX. Equations can be created by pointing and clicking on symbols and icons or by typing in the TeX language. Using the split screen option, the visual equation is displayed above while the TeX code is displayed below. Whenever either window is modified, the corresponding window is automatically updated.

WiziWord 2.0 is available on the HP Apollo 9000 Series 700 and other platforms.

The PC version costs \$595. The workstation version costs \$695.

Contact Microsystems Engineering Co., 2500 W. Higgins Rd., Ste. 950 Hoffman Estates, IL 60195; (708) 882-0111.

Circle 380 on reader card

Black & White Provides UIM/X Builder Engine

Visual Edge Software Ltd. and Black & White Software Inc. announced a distribution agreement for UIM/X, an interface development tool.

Black & White will provide UIM/X and UIM/X Builder Engine technology to vendors requiring rapid GUI development and the integration of end user customization capabilities into their products.

The UIM/X Builder Engine is a user interface builder kernel, which is surrounded by a variety of configurable editing and productivity-enhancing capabilities. Companies, such as CAX organizations, can use the full power of UIM/X 2.5 internally for rapid interface development, and then configure customized vertical market versions of UIM/X for use by their customer base.

Contact Visual Edge, 3870 Cote Vertu, St. Laurent, PQ Canada H4R 1V4; (514) 332-6430.

Circle 379 on reader card

Template Software Releases SNAP 5.0

Template Software released SNAP Release 5.0, an advanced template-based development environment for building business-critical distributed applications. The new release includes improvements in visual programming, introduces new GUI building tools and extends the capabilities of the Shared Information Base (SIB) for the distribution of objects across a network. SNAP's open architecture also has been expanded to provide seamless integration with existing object libraries.

SNAP technology is based on a template concept that promotes large scale code reuse. The SNAP template consists of five components of predefined software. Using an object model, which enables common data representation, SNAP integrates graphic user interfaces knowledge base inferencing, advanced communication protocols, links to

multiple relational databases and facilities to integrate legacy software systems.

Contact Template Software, 13100 Worldgate Dr., Suite 340, Herndon, VA 22070; (703) 318-1000.

Circle 351 on reader card

Softool Releases CCC/Manager 2.1

Softool Corp. upgraded its CCC/Manager product for UNIX platforms and integrated it with its new problem management product, CCC/Pro.

CCC/Manager offers a complete solution for component management, application management, version merging, distributed building and lifecycle management. CCC/Pro manages software problems from the moment they are reported through the complete problem resolution cycle, including actual resolution of the problem.

New features include an interface to CCC/Pro, data administration functions and support for CASE interfaces.

Contact Softool Corp., 340 S. Kellogg Ave., Goleta, CA 93117; (805) 683-5777.

Circle 352 on reader card

IEM Releases New SCSI Winchester

IEM expanded its disk product line, with high-speed fixed and removable Winchester disk drives in a range of capacities. These drives attach via a SCSI interface, and offer compatibility with HP 1000, 3000 and 9000 computers.

IEM's new fixed Winchester drives are available in capacities of 170 MB, 525 MB, 1.2 GB and 2 GB. Removeable Winchester drives can be ordered in 170 MB, 525 MB and 1.2 GB capacities.

IEM also manufactures fixed Winchester drives with HP-IB interfaces and HP-IB and SCSI products, including flexible disk drives, tape drives and autochangers, and optical disk products.

Contact IEM Inc., 1629 Blue Spruce Dr., Fort Collins, CO 80524; (303) 221-3005.

Circle 378 on reader card

ASK, Bradmark Enhance MANMAN/HP

Bradmark Technologies announced that it has teamed up with ASK to provide a major enhancement to MANMAN/HP in release 9.1.

ASK, taking advantage of the Third Party

Interface, and Bradmark are making available a version of Bradmark's SUPERDEX to enhance MANMAN's productivity.

This team effort means eliminating the need to use KSAM files for part number and vendor name lookups. The largest savings generated by using SUPERDEX/ASK interface and most important to the user is not only the elimination of some KSAM files but also an increase in the nightly window by eliminating the need to rebuild KSAM files.

The information for lookups is always updated so you are always generating reports from today's current data. Also, a large amount of disk space previously used by KSAM is now released.

Contact Bradmark Technologies, 4265 San Felipe, Ste. 800, Houston, TX 77027; (713) 621-2808.

Circle 353 on reader card

Cuffs3000 Version 3.0 Enhances Logon Security

SeraSoft announced Version 3.0 of Cuffs3000, the logon security system for the HP 3000.

Version 3.0 features a design modification to the core system and enhancements to the maintenance screens, message subsystems, audit reports and log files. Cuffs3000 features include complete password maintenance and audit capability. Working in either MPE or MPE XL, Cuffs3000 secures users by session names, user-IDs, LDEVs, day, date and time. A job stream security system is also available. Contact SeraSoft, 295 E. Industrial Park Dr., P.O. Box 5763, Manchester, NH 03108-5763 USA; (603) 644-3200.

Circle 355 on reader card

Bradford Releases SpeedEdit Version A.06

Bradford Business Systems Inc. has released version A.06 of SpeedEdit, a programmers full-screen text editor for MPE/iX and HP-UX.

The update includes an improved user interface, more functions and features, greater programmability and configurability, support for Windows NT and Windows for Workgroups, automatic check in/out access to a variety of librarian systems (including PVCS, rcs and others), and support for several new operating systems as well as strong COBOL support.

X-Windows and Windows NT versions

“H P

Professional

always has

articles on

the latest in

computing

technology.

I especially

find the

New Product

section useful

and the

UNIX articles

helpful.”

**Ferris Mahadeen,
Chief Engineer,
Aimco Technology**

HP Professional

(215) 957-1500 FAX (215) 957-4264

offer a new customizable button bar for quick access to often used commands, additional facilities to customize mouse actions, an enhanced command language, and an increase in the number of windows which may remain open at one time to 64. Various compatibility issues with new versions of recent operating system releases also have been addressed.

The character mode version (for SpeedEdit/XL as well as for PC and UNIX platforms) have received improvements in the menuing capabilities as well as the same command language enhancements as the Windows versions.

Contact Bradford Business Systems Inc., 23151 Verdugo Dr., Ste. 114, Laguna Hills, CA 92653; (714) 859-4428.

Circle 362 on reader card

Software Moguls Debuts SM-arch 3.1

Software Moguls Inc. introduced Version 3.1 of SM-arch system software.

Version 3.1 offers system administrators

and information managers improved backup performance by providing higher speed capabilities and supporting streaming on Exabyte's EXB-8500 drives. The new version also includes an optional interleaving capability that allows simultaneous backup of unlimited systems or users on a network.

Version 3.1 also offers a command line interface and shell scripting, allowing power users to complete their backup procedures without using graphical interfaces.

Contact Software Moguls Inc., 12301 Whitewater Dr., Ste. 160, Minnetonka, MN 55343; (612) 933-8790.

Circle 364 on reader card

HP Inks Deal With Applix

Applix Inc. and HP announced a distribution agreement naming Applix as a worldwide reseller of OpenMail, HP's open system electronic mail software product.

Applix is seamlessly integrating the OpenMail product with Aster*X Mail and

Aster*X, an adaptive suite of applications and tools for UNIX workstations in client-server environments.

Aster*X OpenMail will be released first on the HP 9000 Series 300 and 800 computers, followed by the HP Apollo 9000 Series 400 and 700 platform and other UNIX hardware platforms.

Contact Applix Inc., 112 Turnpike Rd., Westboro, MA 01581; (508) 870-0300.

Circle 366 on reader card

Multiplatform Message Delivery With GRACE

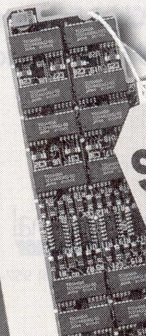
Hermes SoftLab announced GRACE, a multiplatform message delivery system that guarantees secure and reliable message delivery between applications in heterogeneous enterprise-wide environments.

With GRACE, peer-to-peer transaction processing runs efficiently between application components; an API provides a clear split between the application and the network code. GRACE hides the complexity of the

Free!

If you need more memory for your HP/Apollo, you won't want to miss this valuable savings report from Martech. It tells you everything you need to get high-quality memory at the lowest price.

How to save big on memory for HP/Apollo.



Martech carries memory for everything from 700 workstations to HP mainframe alternatives. Our Megamemories™ are 100% HP/Apollo compatible, made from high-quality components and are even backed with a lifetime warranty. To receive your free guide call, write or fax us today. Martech, A Division of Martinsound, Inc. 1151 W. Valley Blvd., Alhambra, CA 91803-2493 Phone: (818) 281-3555 FAX: (818) 284-3092

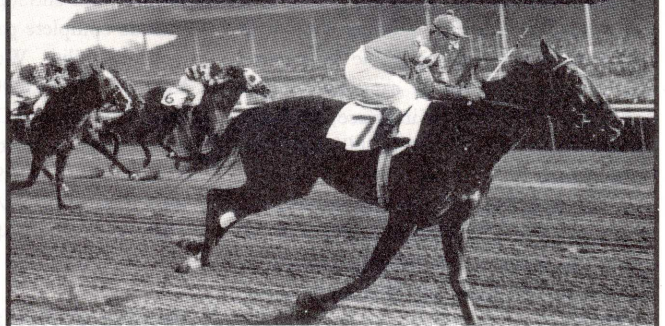
(800) 582-3555



HP and Apollo are registered trademarks of Hewlett Packard.

CIRCLE 220 ON READER CARD

LEADING THE FIELD



That's right, as a leading HP/Apollo reseller, we're ahead of just about everybody in pricing, delivery and inventory.

We have it all, from HP 400 & 700 series through Apollo DN3000 to DN10000. Call us for systems, spares, 3rd party upgrades and peripherals.

For our overseas customers a complete export service is available.

S.A.R. INCORPORATED

11 Rogers Road, Box 8161 Haverhill, MA 01835
Telephone (508) 521-6656 Fax (508) 372-0999

CIRCLE 131 ON READER CARD

READER INFORMATION

This month's issue contains many advertisements for hardware and software products available for your HP systems. Your investment in these products today could mean a more lucrative future for your company. Use the information below to learn more about the advertisers' offerings, then use the reader information card to initiate your direct link to valuable information about these advertisers' products.

ACOM COMPUTER INC. CIRCLE 200

Hewlett-Packard approved product developer specializing in MICR printing (magnetic ink character recognition) for producing checks from Accounts Payable, Payroll and Claims applications. Call (800) 347-3638.

ADAGER CIRCLE 104

The Adapter/Manager for IMAGE/3000 databases allows the manipulation of database objects with a wealth of action. Call (208) 726-8191.

ARTECON INC. CIRCLE 242

Artecon is a leading systems integrator and manufacturer of value-added hardware and software products for the UNIX marketplace. Product lines include: Opticals, Removables, Backups, Storage and Accessories. Call (800) USA-ARTE, FAX (619) 931-5527.

BEAR COMPUTER SYSTEMS INC. CIRCLE 476

MagicDisk includes Virtual Disk, Memory Disk and Disk Shadowing software products. ResQuet is a real-time, shadowing-across-the-network product, for disaster recovery and related applications.

BRADMARK TECHNOLOGIES INC. CIRCLE 108

Your total HP 3000/IMAGE database solution that includes: DBGENERAL, the most complete general-purpose database utility available in the HP 3000 market. And SUPERDEX, the fully compatible indexing package that provides unprecedented data retrieval speed and flexibility. Both are reasons why Bradmark is committed to provide premier data management solutions. Call (800) ASK-BRAD.

COMPUTER MARKETING INTERNATIONAL INC. CIRCLE 454

Independent distributor of new and refurbished HP Apollo workstations and peripherals. We provide in-house technical support and depot repair services. We are committed to providing 100% customer satisfaction on every order. Call 800-497-4CMI.

CONCORDE TECHNOLOGIES CIRCLE 232

Broad line of HP mass storage (disk, tape, optical) and RAM memory upgrades for HP, Apollo, DEC, SUN, RS/6000 and Silicon Graphics computers. Best prices, availability, warranty and support. Call 1-800-359-0282 for complete information and pricing.

CONTEMPORARY CYBERNETICS GROUP CIRCLE 112

Contemporary Cybernetics manufactures a complete family of backup systems that range in capacity from the 150 MB QIC streamer to a 2 TB cartridge handling system. Call (804) 873-0900 or FAX (804) 873-8836.

FALCON SYSTEMS INC. CIRCLE 110

Falcon Systems Inc. is a supplier of UNIX workstation upgrade and enhancement products, as well as a UNIX system integrator and Hewlett-Packard reseller. Products include: memory, disk, tape, optical and mass storage solutions, such as RAID, disk arrays, optical jukeboxes and tape jukeboxes. Also, SCSI, SCSI-2, Fast SCSI-2 and differential disks, all backed by the best warranties in the business. Call (800) 326-1002.

HERSTAL AUTOMATION LTD. CIRCLE 119

Reasonably priced data storage subsystems with performance in mind. Call (313) 548-2001.

HOOLEON CORP. CIRCLE 474

Custom printed Hewlett-Packard keys in your choice of colors. Keytop labels, keyboard templates and more. Call (800) 937-1337 or FAX (602) 634-4620.

IEM INC. CIRCLE 122

Affordable hardware solutions, from memory boards and interface cards to the latest in optical disk technology. Call (303) 223-6071 or (800) 321-4671.

INFORMATION BUILDERS INC. CIRCLE 247

4GL/DBMS for HP MPE XL and HP-UX systems offering application development, reporting and decision support. Supported on all major platforms. Call (212) 736-4433.

KELLY COMPUTER SYSTEMS CIRCLE 185

Manufacturer of performance products: RAMDISC, Spectrum memory, Classic memory, and PC and LaserJet memory. CPU upgrades also available. Call (415) 960-1010.

KINGSTON TECHNOLOGY CORP. CIRCLE 281

Kingston Technology designs and manufactures memory upgrades for PCs, laptops, workstations and laser printers. The Kingston product line also features mass storage subsystems and processor upgrades. Call (800) 835-2545 or FAX (714) 435-2699.

MARTECH CIRCLE 220

Highest quality solutions at the lowest price available. Complete line of memory products for HP 9000, 3000 and 1000 computers. Also RAM for Apollo Domain Series 2500-5500. Ship from stock. Call for your pricing today! Call (800) 582-3555.

M.B. FOSTER ASSOCIATES LTD. CIRCLE 155

DataExpress the #1 End User Computing Environment and report writer. EDI Windows, translation software. Reflection and the Network Series. Call (800) ANSWERS or FAX (613) 448-2588.

NEWPORT DIGITAL CORP. CIRCLE 246

Accelerator cards for HP 9000 Series 200 plus HP 310 and HP 320. Ten-fold performance improvement. Call (714) 730-3644.

ONE SOURCE COMPUTER CIRCLE 106

Leader in workstation services, customized programs, on-site and depot maintenance, 72-hour parts evaluation and repair, remanufactured systems. Call (508) 481-3600.

QUEST SOFTWARE CIRCLE 268

The only complete HP 3000 solution for:

- 1) High speed network file and database access.
- 2) IMAGE, KSAM and MPE file shadowing.
- 3) Low overhead and network spooling.

Call (714) 720-1434.

SYNCHRONICS CIRCLE 455

User defined Hewlett-Packard keyboard keycaps. Keycaps with any legend or symbol printed to the user's specifications. Call (800) 444-5397 or FAX (619) 275-3520.

TELEMON CIRCLE 234

Bisync and async communication tools for HP 3000 and HP 9000 users. Call (916) 622-0630.

TRYONICS INC. CIRCLE 477

Tryonics Inc. is a provider of quality remanufactured HP Apollo, Apollo Domain series workstations, spare parts, network and software consulting services. Call (603) 427-6850.

V-SYSTEMS INC. CIRCLE 128

VSI*FAX is UNIX facsimile management software designed to fax-enable any UNIX software application. V-Systems develops and markets UNIX communications software. For a limited time, VSI*FAX VAR in-house units for \$199. Call (714) 545-6442.

WALKER RICHER & QUINN INC. CIRCLE 263

Makers of Reflection Series Software. HP terminal emulation for PCs and Macintoshes. Call (800) 872-2829.

HP Professional

underlying network from the application programming. GRACE's modular architecture enables use of TCP/IP, NCS or DCE as the communication mechanism, providing multiplatform support and compliance with merging standards. GRACE currently supports HP-UX, SunOS, AIX, Solaris and MPE/iX operating systems.

Contact Hermes SoftLab, Celovska 73, 61000 Ljubljana, Slovenija; 38 61 558 493.

Circle 356 on reader card

Lotus, HP Launch HP 100LX Palmtop PC

Hewlett-Packard and Lotus Development Corp. introduced the HP 100LX palmtop personal computer, an industry-standard handheld computer that runs off-the-shelf PC software programs. Built-in Lotus cc:Mail Mobile gives the HP 100LX portable electronic-mail functionality.

The 11-ounce HP 100LX palmtop PC is targeted as a companion PC for corporate mobile professionals who use portable PC

applications, E-mail and personal-information software.

For remote access to E-mail, the built-in communications capabilities include Lotus cc:Mail, an industry-leading LAN-based E-mail software. The HP 100LX has enhanced built-in personal information management software to make organizing personal information easier.

The HP 100LX palmtop PC is priced at \$749.

Multiview Introduces Laser Check Printing

Multiview Corp. announced that it has incorporated laser check printing into the Multiview Accounts Payable software package for the HP 3000 environment.

By loading a custom printing cartridge into a standard HP LaserJet printer, customers are able to cut checks on multiple bank accounts without stocking special paper or repeatedly loading, aligning and unloading continuous check forms.

To use the LaserCheck option, users need Multiview Accounts Payable Version 6.10/7.10 or above and an HP LaserJet printer Series 3 or above. It is priced between \$2,500 and \$7,500, depending on the complexity of the user's requirements.

Contact Multiview Corp., 1 Van de Graff Dr., Burlington, MA 01803-5171; (617) 229-2225.


Circle 367 on reader card

FOCUS For HP-UX To Access OPEN/image Software

Information Builders announced its FOCUS Document Imaging Interface to Wang Laboratories Inc.'s OPEN/image for HP-UX software.

The image-enabled software allows new and existing FOCUS for HP-UX applications to integrate images easily in any functional area of the application.

FOCUS for HP-UX and OPEN/image for HP-UX run on HP 9000 Series 700 and 800 processors.



FAX From Your HP 9000

"We like the way VSI-FAX easily integrates with our applications."
-Dale Burley, MIS Director, The Santa Cruz Operation

"VSI-FAX is an excellent product...a joy to use." - UNIX Review, November 1992

Thousands of businesses have changed the way they communicate by using **VSI-FAX**, you can too. Call us now!

VSI-FAX is available for: X86 UNIX • SCO • V.3 • V.4 • IBM • Hewlett-Packard • SUN • DEC •
Data General • Motorola • Pyramid • Sequent

Call today for more information!

V-Systems, Inc.

39 Brookhollow Drive, Santa Ana, CA 92705 • Phone: 714-545-6442 • FAX: 714-545-7653

CIRCLE 128 ON READER CARD

CUSTOM KEYS

for **Hewlett-Packard**

Full range of legends & key colors

Custom Keytop Labels
Keyboard Templates & more!

A total line of keyboard enhancements

Call for **FREE CATALOG!**

Toll free **800 937-1337**



Hooleon

CORPORATION

The Leader in Keyboard Innovations™

P.O. Box 230 • Dept. HPRO • Cornville, AZ 86325

CIRCLE 474 ON READER CARD

The initial release of this interface is based on Wang's OPEN/image Application Programming Interfaces (APIs) for HP-UX. A complete spectrum of imaging features, including display, print, scan, copy and verify are available for any HP-UX-based FOCUS application accessing data from FOCUS, Allbase/SQL, Informix, Ingres, Oracle, Sybase, Teradata and Unify. Images associated with these applications may reside on a personal computer, PC LAN or an HP-UX server, and are directly accessed using the FOCUS 4GL.

Price of the product ranges from \$400 to \$16,055, depending on configuration. Contact Information Builders Inc., 1250 Broadway, New York, NY 10001-3782; (212) 736-4433.

Circle 354 on reader card

UTSG Delivers QTrain

User Training Services Group (UTSG) announced QTrain, a PC Compatible AudioDigital Player Training System. The QTrain Player and CourseWare support interactive training for major computer platforms including DOS applications, UNIX and HP 3000 environments.

The QTrain Player is connected to a power source and the PC's serial port. The trainee can select from UTSG's extensive library of CourseWare. Interactive training is delivered with full sound, color support, and visuals of the actual keyboard output onscreen.

QTrain is designed to be like a Personal Tutor. The trainee controls the pace of learning, repeating or skipping sections of CourseWare as required.

Contact User Training Services Group, 125 University Ave., Ste. 145, Palo Alto, CA 94301-1630.

Circle 363 on reader card

PICK Systems, HP Port Advanced PICK To 900/800

PICK Systems and Hewlett-Packard announced that Advanced PICK has been ported to the HP 9000 Series 800 business server.

Engineers from both companies worked to develop the new Advanced PICK port for the HP-UX operating system. Advanced PICK for HP-UX features seamless integration which will enable volumes of users to use a common business application

with high system throughput and data integrity.

Advanced PICK is priced at \$450 per user up to 48 users; \$375 per user after 48 users. Contact PICK Systems, 1691 Browning, Irvine, CA 92714; (714) 261-7425.

Circle 365 on reader card

STR Announces Faxcom Enterprise

STR Software Co. released its newest product, the Faxcom Enterprise. The product combines the company's HP 3000-based FAX/3000 software with the Faxcom 5000, a multihost, multichannel fax server from Biscum Inc.

With the Faxcom Enterprise, HP 3000 users may fax documents automatically through programmatic, spooler, E-mail and interactive interfaces. Users may integrate graphics including signature, letterhead and forms.

A new feature, PersonalFax, allows users to fax from PCs that are serially connected to the HP 3000. With it, users can fax correspondence, spreadsheets or any PC document.

Contact STR Software Co., 3133 Briarmoor Ln., Midlothian, VA 23113; (800) 272-0723; (804) 272-0723.

Circle 368 on reader card

"H_P

**Professional is
different from other
HP publications
because it provides
me with higher level
information and
that's important."**

**James Burton, IS Manager
Boise Cascade**

HP Professional

215 957-1500 FAX (215) 957-4264

HEWLETT-PACKARD

**BUY
SELL
RENT
REPAIR**

**9000 1000
3000 TEST**

**HP WORKSTATIONS
MEMORY - PLOTTERS
PRINTERS - DISC DRIVES
DATA ACQUISITION**

TSA

**THE RIGHT EQUIPMENT. RIGHT NOW.
2040 West Sam Houston Parkway N.
Houston, Texas 77043**

**1-800-422-4872
713/935-1500
FAX 713/935-1555**

CIRCLE 137 ON READER CARD

Datasys

COMPUTER CORPORATION
BUY • SELL • LEASE • TRADE

Hewlett-Packard

- SYSTEMS
- UPGRADES
- MEMORY
- PERIPHERALS

Call Today 800-DATASYS
(328-2797)

Dallas (214) 931-9195
FAX (214) 931-9619
Oklahoma City (405) 947-0475
FAX (405) 947-3046

CIRCLE 484 ON READER CARD

4MM DAT TAPES

HP 60M \$10.49

SONY BULK 15M (325mb) \$8.25

DIC DIGITAL 7.5M (162mb) \$4.99

ALSO AVAILABLE

LASERJET CARTRIDGE \$76.50

VERBATIM BULK 615A CART. \$11.55

THE CPI USERS GROUP
CALL 800-522-4CPI
or Fax (201) 641-8881

CIRCLE 470 ON READER CARD

HEWLETT-PACKARD 9000 IT'S OUR SPECIALTY.

PRINTERS PLOTTERS
LaserJets DraftPros
DeskJets DraftMasters
Rugged Writers Electrostatics
WORKSTATIONS

Series 80, 200, 300, 400

We offer large discounts, outstanding service and immediate delivery. Call us before you buy a printer or plotter!



**TED DASHER
& ASSOCIATES**

4117 2nd Avenue South
Birmingham, AL 35222

(205) 591-4747 or (800) 638-4833
Fax: (205) 591-1108

CIRCLE 233 ON READER CARD

HP-1000

BUY • SELL • TRADE • RENT

Hewlett-Packard Computer Equipment

Complete product line
including, Systems, Memory,
Discs, and Tapes.



HERSTAL

AUTOMATION LTD

3171 West Twelve Mile Road
Berkley, Michigan, USA 48072
Telex 650-321-1560
FAX 313-548-2010
Phone 313-548-2001

CIRCLE 216 ON READER CARD

HEWLETT-PACKARD

1000 • 3000 • 9000

BUY • SELL • RENT • LEASE

MAINTENANCE

PROCESSORS • PERIPHERALS • SYSTEMS

EURODATA INC.

(613) 745-0921

Fax: (613) 745-1172

2574 Sheffield Road, Ottawa, Canada K1B 3V7

CIRCLE 283 ON READER CARD

	I/O Data Systems, Inc.
	3000/9000/1000
	HP
BUY/SELL/TRADE	
(216) 835-2211	
27378 W. Oviatt Bay Village, OH 44140 FAX (216) 835-0220	

CIRCLE 272 ON READER CARD

BUY SELL RENT REPAIR

9000 1000 3000 TEST

MEMORY - PLOTTERS - PRINTERS
DISC DRIVES - WORKSTATIONS - DATA ACQUISITION

THE RIGHT EQUIPMENT. RIGHT NOW.
2040 West Sam Houston Parkway N. • Houston, Texas 77043

1-800-422-4872

713/935-1500 FAX 713/935-1555

CIRCLE 228 ON READER CARD

Read & Write HP Floppies on a PC

ASCII, BDAT, series 200/300, Series 80, Series 70,
HP 41C, 41CV, 42CX, HP150, Sun 386i, Series
1000-A/E/F, HP9000/520, 64000 Development
System, HP Chemstation, Many More, CALL

FLOWCHART RMB CODE

Flowchart your HP Basic Code to ISO9000 standards
in ZERO man hours! ALMA is a CASE tool which
automatically produces a flowchart from HP Basic
source code.

DOS Utility for the Series 200/300

This utility allows the HP Series 200/300 to initialize
DOS formatted diskettes, read, create and write DOS
data files.

HP Basic Translators/Services

HP Basic, MS Basic, C, TransEra HTBasic, Series
80, 98XX, Many More, CALL

Call **OSWEGO SOFTWARE**



P.O. Box 310 • Oswego, Illinois 60543-0310
(708) 554-3567 • Fax: (708) 554-3573

Serving HP Users Since 1986

CIRCLE 287 ON READER CARD

The HyPoint Advantage . . .

INVENTORY

"Specializing in Full
Line of
HP 3000 Products"

Buy ■ Sell ■ Trade ■ Lease

HyPoint Technology
600 Ken Mar Drive
Cleveland, OH 44147

1-800-231-5500

216-526-0323

CIRCLE 217 ON READER CARD

HP 3000

Buy — Sell — Trade
Hewlett Packard Equipment

CALL

713-690-1100
(Fax) 713-690-1130

Surety
Systems

8600 Jameel Road, Suite 120
Houston, TX 77040

CIRCLE 226 ON READER CARD

ELECTRONIC SERVICES, INC.

230 Grant Road Suite B-24
East Wenatchee, WA 98802
FAX 509-662-8271

BUY • SELL • TRADE
HP 1000 • 3000 • 9000
AND TEST EQUIPMENT

All quoted prices are FOB your dock
Call 509-662-9039

Also specializing in
US Government, Military
and related customers.
509-662-6229

Since 1973

CIRCLE 212 ON READER CARD

WE DON'T FIX COMPUTERS. WE PROVIDE SOLUTIONS.

- Expert Depot Repair •
- Emergency Exchanges •
- LaserJet Repair •

HP 1000/3000/9000

Appollo & H-P Workstations

- Sales & Service Support Since 1978 •

C R I S I S

We accept VISA, AMEX and MasterCard
800.726.0726 Sales - 800.729.0729 Service
International - 408.270.1100 - San Jose, California
408.270.1183 FAX

CIRCLE 211 ON READER CARD

25
YEARS
1968-1993

HP Hardware, Repair, Maintenance and
Disaster Recovery Services.

Computer Solutions, Inc.
201-672-6000

CIRCLE 209 ON READER CARD

BUY • SELL • TRADE

COMPLETE HP SYSTEMS AVAILABLE
ALL PERIPHERALS

All items in stock — immediate delivery
All warranted to qualify for manufacturer's
maintenance.

ConAm Corporation

Canada/US 800-926-6264
California 310-419-2200
FAX 310-419-2275

CDLA

RENT • LEASE • MAINTENANCE

CIRCLE 210 ON READER CARD

OUR 13TH YEAR

QUALITY HP EQUIPMENT WITHOUT THE HP PRICE

DON'T UPGRADE YOUR HP SYSTEM
UNTIL YOU GET A SECOND OPINION
FROM THE SECOND SOURCE FOR
HEWLETT-PACKARD
1000-3000-9000 EQUIPMENT

- Consult with us about cost-saving alternatives
- Complete Configurations
 - Individual CPUs-Peripherals
 - Memory Upgrades and Feature Enhancements
 - Classic and Spectrum Equipment

WE BUY
Highest Prices Paid

WE SELL
*All Items Sold Are Guaranteed for HP Maintenance
*Short and Long Term Leases Available

WE TRADE
Over 1000 satisfied Hewlett-Packard users are our
customer references throughout the
United States, Canada, Europe, and the Far East.



C.S.U. Industries, Inc.
135 Rockaway Turnpike, Lawrence, NY 11559
Ask for Mordt: (516) 239-4310 FAX (516) 239-8374



OUR 13TH YEAR

CIRCLE 205 ON READER CARD

HEWLETT PACKARD

Depot Repair

- Expert Depot Repair
- 5 Day Turnaround
- Emergency Exchange Program

BLACK RIVER
COMPUTERS

1-800-837-0061

216-365-9950 Ohio
216-365-3916 FAX

CIRCLE 158 ON READER CARD

SHERLOCK Systems & Solutions

Sensible Solutions To The Mysteries
Of Your Hardware Requirements

Solutions ... Not Just Answers

We inventory a large line
of CPU'S and peripherals.
MPE • MPE-XL • UNIX
Buy • Sell • Trade • Lease



CALL
1-800-827-6804
FAX
216-848-4515

CIRCLE 491 ON READER CARD

AMTEK

YOUR
HP
CONNECTION

• BUY • SELL • SERVICE •

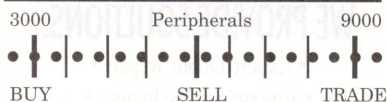
1-800-765-0331

Los Angeles • Washington D.C. • Tampa

CIRCLE 206 ON READER CARD

PRODUCT **showcase**

TUNE INTO HP Pre-owned Equipment



WORKSTATIONS
CPUs
DISC & TAPE DRIVES
TERMINALS & PRINTERS
3000/9000 MEMORY

Lynne Company

(Calif) 805-489-1564
(Outside Calif) 1-800-338-5019
(Fax) 805-481-3799

CIRCLE 219 ON READER CARD

NORCO COMPUTER SYSTEMS, INC.

*Hewlett-Packard Quality
at a NorCo Price*

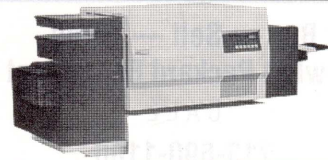
1000 • 3000 • 9000 • 250

**BUY—SELL
TRADE—LEASE**
Processors, Peripherals
and Systems

21337 Drake Road
Cleveland, OH 44136-6620
FAX: 216-572-0636
216-572-4040 1-800-892-1920
(Outside Ohio)

CIRCLE 221 ON READER CARD

LASER PRINTERS FOR LANS, IBM, HP, DEC & WANG FROM GEI



30 PPM Laser Departmental Printer
150,000 Pages Per Month
Postscript Option
HP PCL 5 Emulation

GEI - Ganson Engineering, Inc.
19145 NE Wood-Dvl Rd., Ste# D117
Woodinville, WA 98072
206-788-8010

CIRCLE 255 ON READER CARD

Established 1978

HP Remarketing Specialists

1000 — 1000 — 1000

BUY SELL TRADE

Monterey Bay COMMUNICATIONS

Phone: 408-429-6144
Fax: 408-429-1918

CIRCLE 229 ON READER CARD

HP Software

- ☐ Softbench
- ☐ Interface Architect - UIM/X
- ☐ VUE
- ☐ XRT/graph Widget

Now available on HP, Sun & more

BLUESTONE
The Open Systems Specialist



1200 Church St.
Mt. Laurel, NJ 08054
(609) 727-4600 fax (609) 778-8125

CIRCLE 252 ON READER CARD

INFORMATION

Rates:

1 time: \$525 6 times: \$420
3 times: \$475 12 times: \$365

Size: 1/9 page — 2³/₁₆" x 2³/₄"

**COLOR NOW AVAILABLE
\$100**

- Typesetting and composition available.
- Camera ready mechanical required.

For more information call:

**Lisa Merck
(708) 655-0100**

CAREER **opportunities**

COME JOIN OUR EXPANDING UNIVERSE

Wesson, Taylor, Wells & Associates is a nationwide information technology consulting firm providing solutions to many of America's largest and most progressive corporations. Due to the ongoing expansion of our business, we can provide significant opportunities in a variety of disciplines for **project leaders, analyst/designers, programmers** and a number of technically skilled positions. To discuss the prospects of a stimulating and professionally rewarding career move, send your resume or call today.

WESSON, TAYLOR, WELLS
P.O. Box 12274
RESEARCH TRIANGLE PARK, NC
27709-2274 • 1-800-833-2894



- SYSTEMS INTEGRATION • APPLICATION DEVELOPMENT
- MIGRATION/DOWNSIZING • PROJECT MANAGEMENT
- TELEPHONY • IT STRATEGIC PLANNING

CIRCLE 201 ON READER CARD

HP CAREERS NATIONWIDE

Put your valuable career or job opening in the hands of the experienced HP recruiter who is heavily involved in YOUR industry!!!

- Professional Recruiter since 1975
- Certified Personnel Consultant (CPC)
- Author of "Peopleware" articles
- Speaker at INTEREX, ICMS and HP RUGS
- RUG Council Member and ACSC Rep
- Nationwide database of over 10,000 HP contacts
- Networked nationally for all geographic locations

Call - Amos & Associates



Diane Amos, C.P.C.

633-B Chapel Hill Road
Burlington, N.C. 27215
(919)-222-0231
Fax: (919)-222-1214

CIRCLE 204 ON READER CARD

"H P Professional is very useful. Especially the New Product section and articles on the HP 3000. In fact, the ads are even helpful. I called an advertiser for more information on the HP 3000."

James Burton, IS Manager
Boise Cascade

HP Professional

215.957.1500 FAX 215.957.4264

ADVERTISERS INDEX

Reader Service Number	Page
200 ACOM Computer Inc.	4
104 Adager	17
242 Artecon	I.F. Cover
476 Bear Computer Systems Inc.	32
171 Black River Computers	41
108 Bradmark Technologies Inc.	I.B. Cover
454 CMI	35
232 Concorde Technologies	36
112 Contemporary Cybernetics Group	5
Digital Equipment Corp-MA	6-7
110 Falcon Systems	23
215 Harborside Marketing Inc.	60
119 Herstal Automation Ltd.	33
173 Herstal Automation Ltd.	19
Hewlett-Packard Computer Systems	15
474 Hooleon Corporation	66
166 IBM Scientific Visualization Systems	27
122 IEM Inc.	2
247 Information Builders Inc.	37
458 Insignia Solutions	25
150 Interex	49
185 Kelly Computer Systems	47
281 Kingston Technology Corp.	1
463 Lawson Software	13
250 Lund Performance Solutions	57
155 M.B. Foster Associates Limited	59
168 M.B. Foster Associates Limited	31
220 Martech	64
261 Media Magic	11
488 Newport Digital Corp.	9
106 One Source Computer Services	57
277 Pro Software	12
268 Quest Software	43
455 Syntronics	60
234 Telamon	41
477 Tryonics Inc.	29
300 Tryonics Inc.	61
137 TSA	67
128 V-Systems	66
127 WRQ (Walker Richer & Quinn)	21
263 WRQ (Walker Richer & Quinn)	O.B. Cover

ADVERTISING SALES OFFICES

Leslie Ringe, Publisher
(617) 861-1994

NEW ENGLAND & EASTERN CANADA (617) 861-1994

Alonna Doucette, Regional Sales Manager
238 Bedford St., Ste. 3
Lexington, MA 02173
FAX (617) 861-7707

MID-ATLANTIC & SOUTHEAST (401) 351-0274

Edward Marecki, Regional Sales Manager
One Richmond Square
Providence, RI 02906
FAX (401) 351-0276

MIDWEST & SOUTH (708) 655-0100

Bettina Fischmann, Regional Sales Manager
15 Salt Creek Ln., Ste. 103
Hinsdale, IL 60521
FAX (708) 655-0755

NORTHERN CALIFORNIA, NORTHWEST, WESTERN CANADA (415) 873-3368

Judy Courtney, Regional Sales Manager
903 Sneath Ln., Ste. 220
San Bruno, CA 94066
FAX (415) 873-6608

SOUTHERN CALIFORNIA & SOUTHWEST (818) 577-5970

Karin Altonaga, Regional Sales Manager
1010 E. Union St., Ste. 101
Pasadena, CA 91106
FAX (818) 577-0073

INTERNATIONAL (617) 861-1994

Leslie Ringe, Regional Sales Manager
238 Bedford St., Ste. 3
Lexington, MA 02173
FAX (617) 861-7707

Cheryl Demaiorbus, Marketing Services Manager
Lisa Hartman, Marketing Services Assistant
Lori Goodson, Customer Service Manager
Mary Browarek, Card Deck Manager
Cathy Dodies, List Rental Manager

HP Professional

101 Witmer Road • Horsham, PA 19044
(215) 957-1500 FAX (215) 957-1050



**Gordon
McLachlan**

once in a while, sit up all night fixing some rogue database, or read about an Airbus augering in because its fly-by-wire controls had a little bug. That's life. High-tech has its risks. I just can't take it when computers start messing with life's basic necessities.

The whole episode began simple enough. My mother-in-law had a taste for tacos that was quickly affirmed by my six-year-old son and wife — who had better things to do than serve her family a healthy, nutritious meal. You can't beat that for unanimity, so I loaded the kid into the car for a routine run for gut-bombs.

As we drove up to Taco Bell, there seemed to be unusual activity in the parking lot. Lots of cars were coming and going — more than usual. I headed for the drive-thru lane, but found it blocked by a beat-up Ford with a sign in the windshield: "Drive Thru Closed." Figuring the window was broken or something, I turned the car around and parked.

As the kid and I headed toward the restaurant, we were met by a fellow who was leaving, and he informed us that we couldn't get any food there, because the computers inside were down. That blew me away.

How could a computer system going down stop me from feeding my family greasy food? I knew a computer system could stop an assembly line at an auto plant. I've come within a few minutes of that happening once, but I didn't think that was the problem here. The last time I looked, the taco line was still manned by pimply-faced teenagers, who weren't

worth replacing with robots. At least not until Bill and Hillary get their health plan.

Curious though it was, the kid and I were more interested in tacos than the truth, so we didn't hang around to investigate. Jumping into the car, we headed south to another Taco Bell three or four miles away.

two, so it could feed us. Unfortunately, we'd have to wait 20 minutes or so, because the place was swamped with business from the stores whose computers were down. Apparently everybody was desperate for some of that south of the border action.

I've been around hi-tech for a while, so I'm no stranger to computer failures.

It's no big deal to do without bean burritos for a couple of hours, but if American taco production isn't safe from downtime, what is?

Driving impatiently through rush-hour traffic with a hungry six-year-old who alternates complaints of "Dad, I'm hungry" with "Dad, I have to go to the bathroom, real bad" was not the high-point of my day. But it wasn't the low-point either. That came when I pulled into the lot of Taco Bell numero dos. The parking lot was full, and there must have been 10 cars in the drive thru. Not only wasn't I going to be getting the tacos, the kid wasn't even going to get to the can. There was no place to park.

I headed home in defeat. By now, the kid had to go real bad, which apparently kept him from noticing that we didn't have any food yet. Once hunger returned as his primary biological imperative, the complaining started. "I want tacos! You said I could have tacos!"

My wife called the third Taco Bell within driving range to see what the story was. The store said it didn't have the same computer system as the other

If the things always worked the way they're supposed to, a lot of us would be out of nice jobs. But this one galled me. It exemplified the kind of thinking that gives computers a bad name.

I understand why Taco Bell computerized its stores. It benefits from point-of-sale systems just like any other retailer. What's inexcusable is the poor system design that crippled its operation when they had a glitch. Either someone decided it would be better to shut the place down than lose count of the tortillas, or its system decided it for them. Either way, it was pretty stupid.

Any system should either be redundant or have a manual workaround. To do otherwise is to court disaster. Granted, it would be no big deal if the world had to do without bean burritos for a couple of hours, but if American taco production isn't safe from downtime, what is?

Database solutions couldn't be brighter!

Integrity Check

Capacity Management

Capacity Trend Analysis

Backup Compression



Performance Analysis

Structural Changes

Test Database Generation

If you are having difficulty determining what database utility is right for your system, Bradmark has plotted a clear path for any IMAGE user.

DBGENERAL, the most comprehensive database utility available for all HP3000s, will globally diagnose many of your database problems, while overseeing your entire database operation. And speed... DBGENERAL will analyze and fine tune your database performance to guide your way through millions of entries, fast. With over 40 options to choose from, you won't find a database utility more complete.

So stop gazing into a dim, vast unknown and discover why over 10,000 HP3000 sites worldwide found DBGENERAL as their premier database utility.

Contact a Bradmark representative at 1-800-ASK-BRAD, and plot a course towards a brighter world of solutions today!



BRADMARK
Technologies, Inc.

ENGLAND
BRADMARK UK Ltd. (44) 905-795444

AUSTRALIA
Pacer Info. Design (61) 2-484-3979

BELGIUM
Cheops Technology (32) 03-237-7906

C.A.G.E.S. (32) 56-41-83-99

DENMARK
Teamco Data A/S (45) 75-92-5366

FRANCE
ARES (33) 1-68-86-6000
GREECE
HP Consultants (30) 1-772-8561
GERMANY
I.A.B.G. (49) 89-6088-2074
JF Infosys GmbH (49) 6722-6044
SWS Software GmbH (49) 7621-7804
ISRAEL
Sofikol (972) 3-348-936

MEXICO
Infosistemas Financieros AS (525) 255-0293
NETHERLANDS
Quant Systems (31) 2503-40334
NORWAY
Teamco Datasoft AS (47) 22-46-8820
SAUDI ARABIA
Saudi Info. Technology (966) 1-477-4555
SINGAPORE
Info-Tech Computer Sys. (65) 737-4161

SWITZERLAND
SWS Software Systems (41) 31-981-0666
SWEDEN
Ole Nord AB (46) 8-623-0050
Teamco Nardata (46) 9-103-6480
TAIPEI
Hewlong Info. Corp. (886) 2-545-2166
WEST MALAYSIA
Solsis (60) 3-256-1911

PC connectivity?



Reflection makes it child's play.

If connecting PCs to minicomputers, mainframes, and servers has you puzzled, choose Reflection® and Reflection Network Series® software from WRQ.

No other software vendor offers such a complete solution to integrate personal computers with HP 3000, HP 9000, VAX/VMS, UNIX, and IBM systems. Reflection provides the most precise terminal emulation for text and graphics, fast file transfer, a versatile command language, and more—for DOS, Windows, and Macintosh platforms. Reflection also offers a reliable PC X server. All backed by

a solid company with exceptional technical support.

If you want to run host and server applications at the same time, add the Reflection Network Series. Run NS/VT, LAT, Telnet, and TCP/IP concurrently with LAN protocols from a single PC, over Ethernet or Token-Ring networks. The Reflection Network Series also includes support for Berkeley Sockets, NetBIOS, and NetIPC—yet it takes remarkably little memory.

Putting all the pieces together can be challenging. So avoid the mind games.

True genius is simplicity. Whether you need basic PC-to-host connections, links to multiple hosts and LANs, or you're moving to the world of X, there's one obvious solution: Reflection.

To solve your connectivity
problems call

1-800-92NETWORK

 **Reflection®**
Making PC Connections Count